VI.5.4-IFP OPERATIONAL FORECAST SYSTEM INTERACTIVE FORECAST PROGRAM (IFP)

Introduction

The Interactive Forecast Program (IFP) consists the hydrologic physical process modeling of the Operational Forecast System (OFS) combined with a graphical user interface to provide:

- the information needed to make decisions about the correctness of data or model results and
- the capability to easily and quickly put those decisions into action to produce forecasts reflecting their best judgement about current and future hydrometeorologic conditions

There are two main applications which make up the IFP:

- IFP_Map consists of a geographic display which allows the user to choose the subarea and time period for which to run the OFS. This display and its associated menu system allow for control of the sequence of OFS runs and provides different display options.
- ifp_nwsrfs performs the hydrologic computations, displays the model results and allows the user to interactively make model adjustments as needed. It is called automatically from IFP_Map when appropriate.

The user interacts with the OFS through the IFP using point and select actions in numerous windows that are displayed during an IFP session.

Typical Run Sequence

The following briefly describes a typical run sequence and presents some of the windows one would encounter.

A typical IFP session begins with choosing a time period and a subset of forecast points (Forecast Group) with which to work (Figure 1a and Figure 1b). The data is loaded and the geographic display zooms in on the selected Forecast Group (Figure 2). In addition a schematic showing how the forecast points are hydrologically connected is displayed (Figure 3). Both the schematic and geographic display are color coded to show an overview of the current hydrologic conditions.

To make a forecast run using the default options, the user selects **Begin** from the **File** menu (Figure 4) which runs the hydrologic models for the most upstream forecast point (Figure 5) and the results are displayed (Figure 6). At this point, changes can be make to certain input data and parameters then rerun the current forecast point or continue on to another forecast point. This process is repeated until the user is satisfied with the forecasts for the forecast point in that area.

Overview

The rest of this document steps for using the IFP to provide guidance for river and flood forecasts including the use of many of the options.

The IFP is a 'front end' program for using the Operational Forecast System. It provides everything necessary to run the hydrologic component of OFS interactively and was designed to help in the process of creating run time modifications (MODs). IFP uses the Forecast Group as the basic unit for modeling the rainfall runoff process. A Forecast Group is a drainage basin that is comprised of contiguous, topologically connected sub-basins (called forecast points or Segments). It is at the sub-basin scale that the hydrologic models are applied.

Interactive hydrologic modeling takes place within Segments, where the models can be run, adjustments to model parameters can be made and the models can be rerun for the current sub-basin. The process of running, making parameters changes and rerunning the models for a particular Segment continues until the user is satisfied with agreement between the observed and simulated flows. These flows are input to the next downstream sub-basin. Inflows from upstream Segments are routed through a downstream Segment using one of the routing Operations and are combined with each other and any local runoff.

Operations define the hydrologic models that are used within every Segment. The choice of which routing Operation to use, as well as any other Operation, is made well in advance of using IFP. The Forecast Group topology, Segment definitions, selection of hydrologic Operations for each Segment, etc., are created using the OFS file initialization programs PPINIT and FCINIT. Program FCINIT is used when a Forecast Group is created changes need to be made to a Forecast Group, such as adding, removing or combining Segments or changing the Operations used within a Segment.

Starting an IFP Run

Two windows initially appear when an IFP_Map run is started; one is a geographic display of the area; the other shows all the Forecast Groups that are in Carryover Groups (Figure 7).

When a Forecast Group is selected the carryover dates available appear in the right-hand column (Figure 8).

There are two available choices for the source of data for an IFP session:

1. making a copy of the operational set of files in the user‹s home directory

2. using the copy of files already in the user‹s home directory (Figure 9)

There will be times when you want to choose each of these sources. Initially (the first time the Forecast Group is run), you must get all data from the operational file set. This includes parametric, Rating Curve, Segment connectivity, Operations Table and HCL default values; as well as current carryover, time series and run time MOD data. You should only have to make this type of transfer to get the most recent data to run a Forecast Group or whenever any parametric, Segment connectivity, Rating Curve or HCL default information changes on the operational files.

The second choice is to get all the data for the current session from the copy currently in the user‹s home directory. This will not reflect any changes that may have been made to time series, carryover or run-time MODs on the operational files since the user‹s last IFP session. This choice is significantly faster to start up than the other because the OFS files do not have to be copied, but be warned that you will be missing any recent changes that occurred on the operational set of files.

In addition to the Forecast Group and data source, you must also select a date to begin the forecast run. The available dates of carryover are displayed in the right-hand column and can be selected to determine the start date of the run (Figure 9). Again be warned that if you chose the **Use previous IFP** option, all the dates shown may not be available. The forecast component will find an alternate date of carryover if the one you chose is not in the user‹s copy of the files and change the start of run date accordingly.

Online help is available for the IFP application. A sample of the help for selecting a Forecast Group and carryover date can be seen here in Figure 10. It shows three different ways to access help about a topic. The first would be to highlight a word or phrase in the displayed discussion in the top panel then click on the Find button. The help system then searches the help files to find that word and creates a list of the general topics that contain that phrase. Another way to get help about a topic would be to click on the topic of interest from the list in the middle panel. The third way would be to type in the word or phrase in the bottom panel then click on Find.

In addition to help available by selection **Help** buttons, context-sensitive help is in many menus and displays in the IFP. This help should tell the user what will happen if they select the button at which they are currently pointing. The user could see the (Figure 10) following message by holding the left control key and moving the mouse over the Load button (Figure 11).

When Load is selected, data is read from the chosen data source for the desired Forecast Group and carryover date. Depending on the data source and the size of the Forecast Group chosen, this may take some time. It can be seconds for getting data from the the user‹s own copy of files, to several minutes to copy all the data from the OFS files. A pop-up message indicates that the data is being retrieved (Figure 12).

IFP_Map - Initial Displays

After the data is loaded and the geographic display zooms in on the selected Forecast Group (Figure 2). In addition a schematic showing how the forecast points are hydrologically connected is displayed (Figure 3). Both the schematic and geographic display are color coded to show an overview of the current hydrologic conditions.

In the schematic the small boxes with forecast point names in them represent the individual Segments in the Forecast Group. The lines connecting the boxes show stream connectivity. Water flows from left to right in the schematic. Forecast points immediately up or downstream of the forecast point are also shown in this schematic to help orient the user and provide information about connectivity among Forecast Groups.

The color of a forecast point's box represents its current flow condition. Green indicates a normal flow condition, near bankfull or alert conditions are indicated by a yellow color and flood conditions are shown in red. If there is no Rating Curve for a Segment, its flow condition cannot be determined and it is shown in gray. The same color scheme is used in the geographic display for the basin outlines.

IFP_Map Menu System - Controlling IFP Displays and the OFS Run

After selecting the Forecast Group and start of run date in the initial window, a user can run the hydrologic modeling system. The models used in the IFP are the same as those used in the Calibration System and the Operational Forecast System. The capabilities available in the IFP are the color graphical display of much of the information now presented as printer output and the ability of a user to make adjustments through the IFP graphical user interface.

To produce a graphical plot of the model outputs and observed data, a user must select **Begin** in the IFP_Map **File** menu (Figure 13). This will run the Forecast Component using default settings for a number of options which are described in the following pages and produce a plot of the resulting hydrographs (Figure 14). With this one point-and-select (Figure 13 and Figure 14) action a user can be running. The rest of this document describes the various options which are available to see and adjust components of the river forecasting system.

The IFP_Map menu bar has several pull-down menus. These are for the control and display of the many features available.

The File menu has seven entries to control the flow of the IFP_Map program (Figure 13). At various times during the run, different items will be dark and sensitive (able to be selected) while others will be grayed out and insensitive (not selectable). When the application starts, the only two valid choices in the **Control** menu are to **Begin** a run and to **Quit**. During the processing of forecast points, the other choices will become sensitive. The choices are (1)

to **Begin** a forecast run, (2) to **Rerun** the current forecast point to cause any run time MODs to take effect, (3) to run the **Next** downstream forecast point, (4) to **Continue** to another Tulsa plot in the current Segment, (5) to **Go to a selected segment** either up or downstream of the current one, (6) to choose a **New Forecast Group** to work with and (7) to **Quit** the IFP_Map application. There are letters to the right of the command name on many of the choices in this pull-down menu. These accelerator keys can activate the selection without pointing and clicking with the mouse. When keyboard input is focused to the IFP_Map window (i.e., its border is highlighted) the action in a pull-down menu can be obtained by holding down the control (Ctrl) key while pressing the appropriate letter key. These accelerators also appear on most other pull-down menus.

The **Options** menu (Figure 15) allows the user to set a number of options prior to the start of hydrologic computations. The ten items in the menus let the user keep a group of Segments selected by clicking on the small boxes with the Segments' names in the main IFP_Map schematic. When a forecast point is selected, all Segments upstream of that point are (Figure 15) also selected. This ensures that the IFP always works with a connected tree structure of forecast points. After points are selected, one may (1) **Keep** them as noted above or (2) **Delete** them from the current run or (3) **Reset** to be unselected. These three Options menu subcommands may be repeated to obtain the desired set of forecast points for the current run. When **Begin** is selected in the **File** menu, the hydrologic computations start. If (4) **Single segment when Begin** appears in the **Options** menu (the default), the first Segment at the top of the run Segments list will be executed and a hydrograph plot will be displayed. If this menu item is selected, the text displayed in the menu changes to **Go to segment when Begin** the meaning of a selection in the schematic or map Forecast Group windows changes. A selection in either of these windows will now choose the Segment at which a hydrograph plot will first be displayed when **Begin** is selected from the **File** menu. Hydrologic computations will be performed for all Segments upstream of the chosen one, but the plot will not be displayed until the chosen Segment is reached. The (5) **Revert to original Forecast Group topology** option could be invoked if, after some deletions of forecast points from the original Forecast Group schematic, the user decided that too many had been removed. This would rebuild and display the original tree. The (6) **Revert to original map view** option results in the geographic display returning to the view of the whole area from the zoomed in view of an individual Forecast Group.

The (7) **Set dates...** option will pop up a window which allows the end of observations and end dates to be changed (Figure 16). Note that the start date was specified by the carryover date selected in the Select Forecast Group and Carryover Date window at the start of the IFP_Map run (Figure 8). A date can be changed by selecting on any of the month, day, year or hour buttons and then increasing or decreasing the value by selecting one of the arrow buttons.

The (8) **Tools** option brings up a panel of tools that can be used in association with the geographic display (Figure 17). These tools put

the cursor in different modes to get different kinds of information or take actions. There are tools for: (a) putting the cursor in standard pointer mode; (b) selecting a rectangular area of the geographic display; (c) displaying the latitude, longitude position of the cursor in the display; (d) displaying E19 information about a forecast point (described below); (e) finding the radius of a circle drawn on the display; (f) displaying the distance of a line drawn by the cursor on the display; (g) zooming out to the next higher level and (h) zooming into the area outlined with the select tool (b).

As an example in the use of these tools, static or non time dependent information about each forecast point can be seen by first selecting the **'?'** tool then selecting the basin of interest in the geographic display. An information pop-up appears with data obtained from the OFS Rating Curve file (Figure 18). This 'E19' type data typically gives the forecast point's description, latitude, longitude, area and various flood, alert and flood of record information.

The (9) **Preferences** button has a submenu that will allow one to bring up a display to make some color choices for parts of the IFP_Map display. The (10) **Techniques** option (Figure 19) allows the user to set **Universal** and **Nonuniversal** Techniques which control numerous options in the hydrologic models. The Universal Techniques apply throughout the run while Nonuniversal Techniques can be changed for any forecast point.

The **Universal** Techniques window allows the user to change time zone, units and other Operations (Figure 20). Time zones may by changed by selecting and holding on the current setting and then moving the mouse to the desired setting before release (Figure 21). Units toggle between English and metric. The Sacramento SMA model units for run time MODs is being changed to metric. In addition, the choice of using forecast or zero precipitation beyond the end of the observed data period can be set, as well as whether or not to print warning messages from run time MODs.

The **Nonuniversal** Techniques window allows the user to set Techniques used to control the snow model, the frozen ground option of the Sacramento SMA model, UPSC, UPWE and the Sacramento/snow state display (Figure 22). These options can be turned on or off for all forecast points in the current run or can be changed for selected points.

The **Display** menu (Figure 23) controls which informational items appear. The forecast points that have been deleted (1) or are in the run (2) can be displayed. Also during the hydrologic computations the Operations Table (3) and if available the **Rating curve** (4) for the current Segment can be shown. The **Forecast Group topology** (5) schematic or a window showing the **Current Run Time MODs** (6) can also be displayed. In addition, the **Geography** (7) option allows numerous geographic overlays to be displayed (Figure 24).

The **Modifications menu** (Figure 25), which becomes sensitive while processing the hydrologic computations for a forecast point, allows the user to display or hide windows for the (1) graphical **Tulsa plot**,

(2) **Time-Series table** tabular data and (3) run time modifications, Other MODs.

The **Help** menu item in this and many other windows gives online information about how to obtain further help if you are at a loss for what to do next (Figure 10). Context-sensitive help is used extensively throughout the IFP to remind a user of the purpose of a particular menu item. Here context-sensitive help for the **Modifications** menu item is shown (Figure 26).

Run Preparation - Before Begin

To remove some forecast points from the current IFP run (Figure 27), the user selects a forecast point in the IFP_Map schematic window. The selected point and all points upstream are highlighted (Figure 28).

These selected points may now be kept, deleted or reset to unselected. The top three buttons in the **Options** menu have become sensitive indicating that Segments have been selected to be acted upon. By selecting **Delete** in the **Options** menu, the Forecast Group schematic will be changed to reflect that now only a subset of the original group will be run.

The Forecast Run - Selected Options

A forecast run is started by selecting **Begin** in the **File** menu (Figure 29). The Operations Table for the appropriate Segments are run until a Tulsa plot Operation is found, at which time a graphical Tulsa plot is displayed (Figure 30). The Tulsa plot display contains three main plot areas. The top area is a plot of the precipitation time series (MAP or RAIM). Digital information about the time and time series value may be obtained by selecting and holding the left mouse button while in the precipitation plot area. Cross-hair appear on the window and a numeric display of the X Y coordinates of the mouse are shown in units of time and time series value (Figure 31). The middle plot is a plot of the runoff time series (INFW) (Figure 32) and the bottom plot is the plot of the hydrographs (Figure 33). Holding the left mouse button in any of these plots will bring up the cross-hair and associated information for the appropriate plot.

The following section describes the various additional displays that can be viewed and the options available for making run time modifications. Now that the hydrologic computations have begun, the **Display** menu has changed to become sensitive to show the Operations Table and, if applicable, the Rating Curve (Figure 23). Selecting **Rating curve** causes the Rating Curve associated with the current Tulsa plot to be plotted (Figure 34). In addition to the general shape of the Rating Curve, information about specific point values can be obtained by holding the left mouse button as described above for the plots in the Tulsa plot display.

Selecting on the **Operations table** button in the **Display** menu causes a

window to appear which lists all Operations for the current Segment's Operations Table (Figure 35). Selecting an Operation in the list and then selecting Show in the Operations Table window will pop up a window with text output the same as the program FCINIT command PRINTSEGS. The parameters and carryover for the current Sacramento SMA model are shown in (Figure 36).

Time Series Change Modifications

Time series which are displayed on the Tulsa plot may be changed by selecting on the name of the time series in the Tulsa plot legend. This will cause all other legend items to dim and the selected series to turn white on the plot.

New values can be entered by selecting and holding with the mouse and moving to the desired value. Temporary lines will move with the mouse (Figure 34) during value entry to help aid the user to see the shape of the newly entered values (Figure 37).

When changes are complete, the user selects again on the time series legend button to record the changes (Figure 38). These changes can be removed by again selecting the time series legend button and then selecting the undo time series change button (Figure 39).

Time series changes can also be made in the tabular display window. The user first selects the cell in the table to change and edits the value. Pressing Enter after changes have been made will cause the new value to display in red in the table. Values changed in the table for time series that are plotted will also change the plotted values (Figure 40). When plotted, time series which are also tabulated are changed in the plot, their new values appear as red in the table window.

When a time series change MOD is made a keyword indicating where in the processing of the Operations Table the MOD will occur is needed. When the user selects **Rerun** and a time series change MOD has been entered, a window to select keywords will pop up (Figure 41). The user must either use the defaults provided, where available or select before which Operations the MOD will be applied. The defaults are to specify First (before first Operation) for input time series, the current Tulsa plot for output time series and no default for internal time series. The user will know when an acceptable keyword has been chosen because a check will appear to the left of the time series name. The **Rerun** command can proceed only when all time series are checked.

Other Run-Time Modifications

Starting the hydrologic computations also makes the entries in the **Modifications** menu sensitive (Figure 42). The Tulsa plot and tabular data window may be visible or hidden at the user's preference.

Selecting **Other Mods** displays the main run time modifications window.

This initial window is blank, but will hold the formats for entering many of the run time MOD changes (Figure 43).

The **Control** menu for run time MODs has four entries (Figure 44). They are used to: (1) **Cancel Last** MOD made by the user, (2) **Cancel All** MODs made for this forecast point, (3) **Save** the current run time MOD and (4) be **Done** with MODs and close the MODs main menu window.

The **Display** menu allows the user to view: (1) MODs currently being created, (2) MODs for this Segment made earlier by the IFP and (3) MODs transferred from the OFS file set at the start of the IFP session (Figure 45). The user may delete current MODs or ones made earlier by the IFP by selecting the appropriate actions in the viewing windows. The IFP user cannot remove MODs transferred from the OFS. The 19 run time MODs currently available in the IFP are shown in the **MODs** pull-down menu (Figure 46). Only the MODs that could be used for the current forecast point are sensitive. In this case, none of the MODs for the API Operation are sensitive because this forecast point uses the Sacramento SMA model.

Again, **Help** provides information about the current portion of the IFP and describes how to get context sensitive help for additional details about any particular command. Here context sensitive help is displayed for the MODs menu button (Figure 47). Help for a particular MOD can be displayed by holding the left control (Ctrl) key and moving the mouse over the MOD name in the MODs pull-down menu.

There are several distinct types of MOD changing templates. The SACBASEF MOD is an example of a MOD where a single value is entered (Figure 48 is not included). In this case a template with a slider bar appears to allow entry of the desired value. The MOD is then saved by choosing the **Save** option from the MODs **Control** menu (Figure 49). After saving the SACBASEF (or any other) MOD the **Rerun** entry in the IFP_Map **File** menu will be sensitive (Figure 50). In general only valid options in the **File** menu will be sensitive during the processing of the IFP.

Another type of run time MOD is the IGNORETS MOD. For this MOD the template that appears in the main MODs window has a four-choice pop-up list. When this MOD initially appears, the word All is in a push-button. By selecting and holding the left mouse button on the push-button, a pop-up with the valid choices for IGNORETS MOD keywords appears (Figure 51). Moving the mouse to the one desired and releasing will cause the choice to display in the push-button. In this case, a MOD is being chosen to ignore mean observed data for this forecast point.

The RAINSNOW MOD is similar in that it has a pop-up menu to select the type of precipitation, but it also has a scrolled list of dates from which the user can select the dates for which the MOD will apply (Figure 52).

If the user goes on to another MOD without saving the current one, a warning pop-up provides another chance to save the current MOD before

moving on (Figure 53).

The UHGCHNG MOD allows the user to change values in the unit hydrograph in a manner similar to changing time series on the Tulsa plot. The initial UHGCHNG MOD template has a button labeled Plot. When first choosing the UHGCHNG MOD the Plot button is automatically depressed for you and a plot of the unit hydrograph ordinates appears (Figure 54). Values can be changed by selecting the label button and then clicking and moving the ordinates on the plot. In the case shown in Figure 55, the user has adjusted the unit hydrograph for the current storm because the major concentration of rain was near the basin outlet, so the time to peak of the unit hydrograph should be decreased. The IFP re-scales the ordinates of the unit hydrograph so volume is conserved.

Reservoir flow values can be entered with the SETQMEAN MOD by typing the values into a table (Figure 56). As with the UHGCHNG MOD the initial SETQMEAN MOD window has a button which must be selected to allow entry of values. This button is labeled Enter Flows. The value entry window allows the user to type in flow values, pressing Enter or selecting the Next button to move to the next value (Figure 57). Multiple values can be entered as shown in Figure 58. The values entered are converted into entries in the values list (Figure 59).

Typically the user will proceed through a cycle of making adjustments to a Segment, rerunning and then moving to the next Segment downstream. There may be times when the user will want to process some intermediate forecast points without seeing the Tulsa plot display or making adjustments. Or there may be times when they will want to go back to an upstream Segment to make adjustments based on information seen in the current Segment. In either case the user can select in the forecast point schematic or on the geographic display, the Segment to go to and then select **Go to segment** in the IFP_Map **File** menu. If the Segment to go to is downstream of the current one, all intermediate points will be computed but no Tulsa plots will be displayed until reaching the selected Segment. If the Segment to go to is upstream of the current one, it will be the next one computed and its Tulsa plot displayed.

When the user is finished with an IFP session the **Quit** entry in the IFP_Map **File** menu will begin the IFP shutdown process. First a pop-up will appear asking if the user wants to send the MODs generated during this session to the OFS files so they will affect save carryover and other runs (Figure 60). If finished with that Forecast Group then 'Yes‹ should be selected. If not finished or the MODS are not to be sent then choose 'No‹ so that MODs are not transferred at this time. They do remain available for later use.

If MODs are sent to the OFS then a subsequent pop-up will appear telling the user that additional processing is happening to merge the MODs into a single file and transfer it to the OFS files (Figure 61). A batch OFS run is then automatically initiated to incorporate the new MODs into the operational files so the updated time series and MODs are available to the next user who copies the files.

Figure 1a

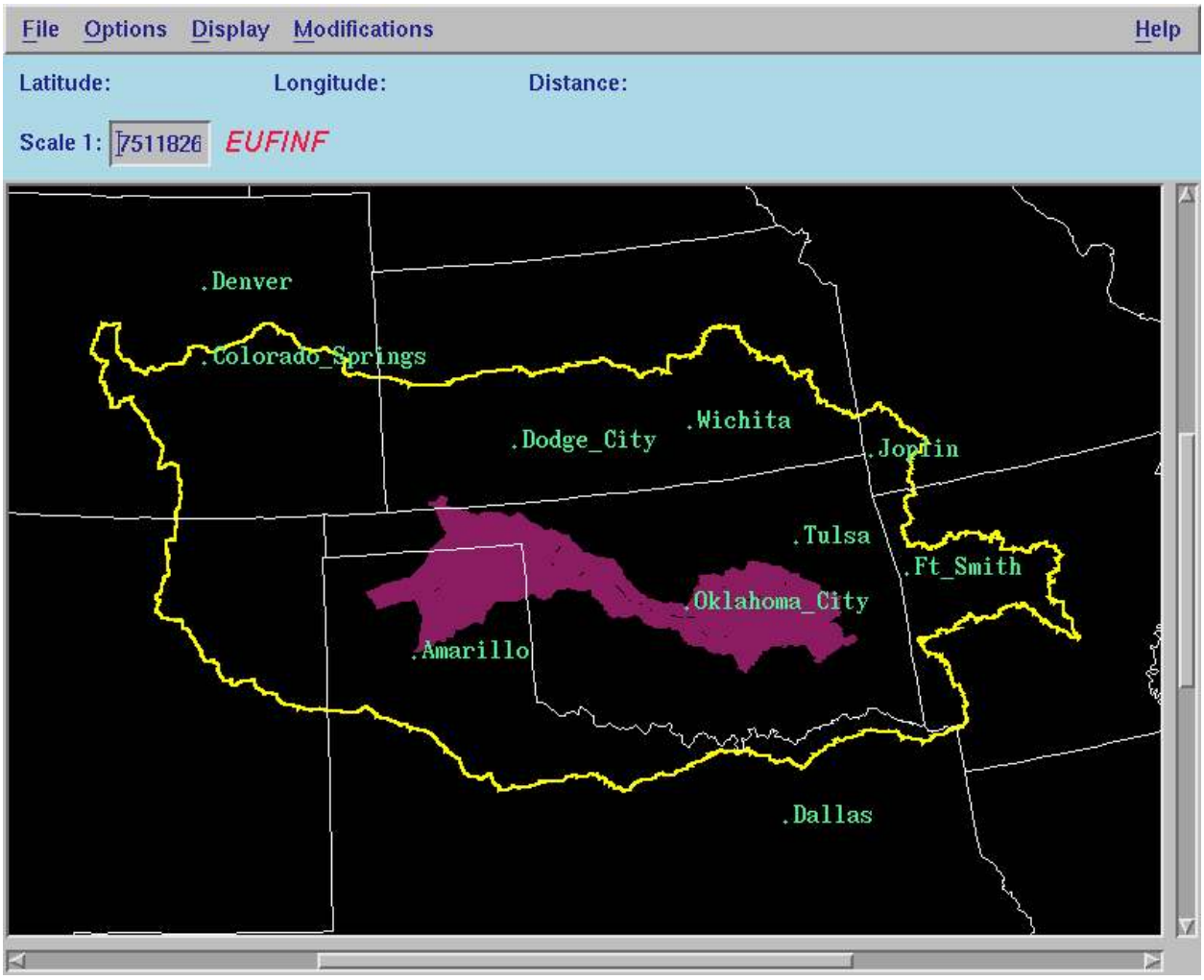

File
Options
Display
Modifications
Help
Latitude:
Longitude:
Distance:
Scale 1: 7511826
EUFINF
.Denver
.Colorado_Springs
.Dodge_City
.Wichita
.Joplin
.Tulsa
.Ft_Smith
.Oklahoma_City
.Amarillo
.Dallas

Figure 1b

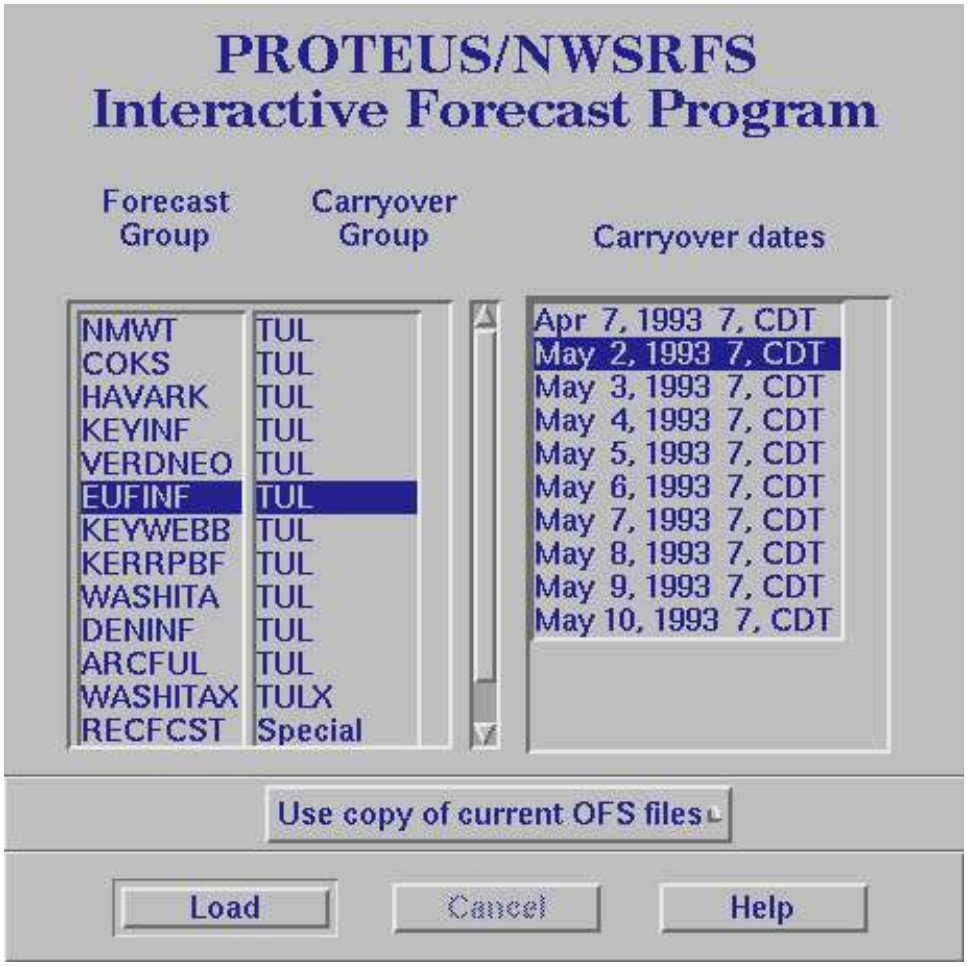
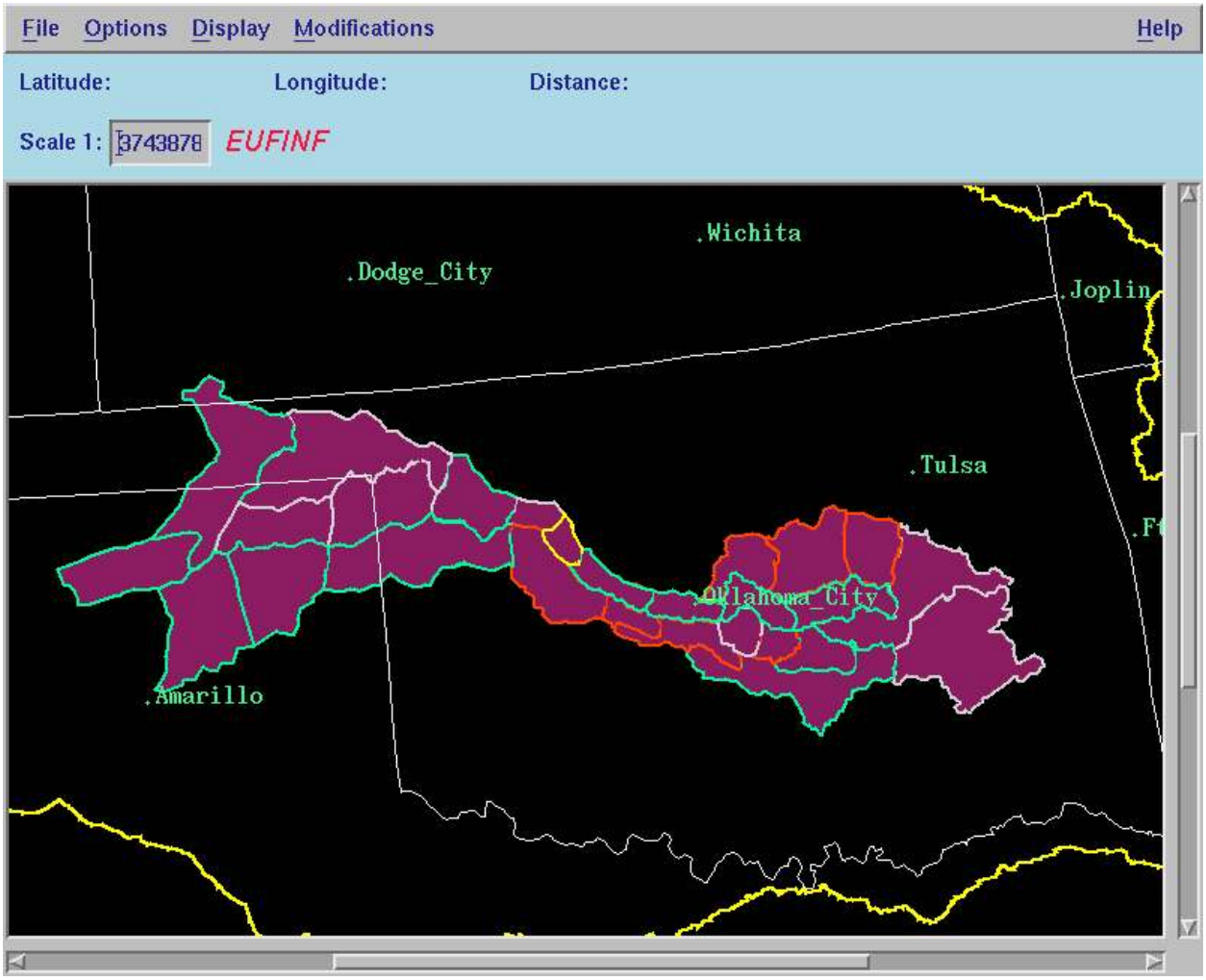

PROTEUS/NWSRFS
Interactive Forecast Program
Forecast Group
Carryover Group
Carryover dates
NMWT TUL
COKS TUL
HAVARK TUL
KEYINF TUL
VERDNEO TUL
EUFINF TUL
KEYWEBB TUL
KERRPBF TUL
WASHITA TUL
DENINF TUL
ARCFUL TUL
WASHITAX TULX
RECFCST Special
Apr 7, 1993 7, CDT
May 2, 1993 7, CDT
May 3, 1993 7, CDT
May 4, 1993 7, CDT
May 5, 1993 7, CDT
May 6, 1993 7, CDT
May 7, 1993 7, CDT
May 8, 1993 7, CDT
May 9, 1993 7, CDT
May 10, 1993 7, CDT
Use copy of current OFS files
Load
Cancel
Help

Figure 2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Options
Display
Modifications
Help
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Longitude:
Distance:
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.Tulsa
.Oklahoma_City
.Amarillo

Figure 3

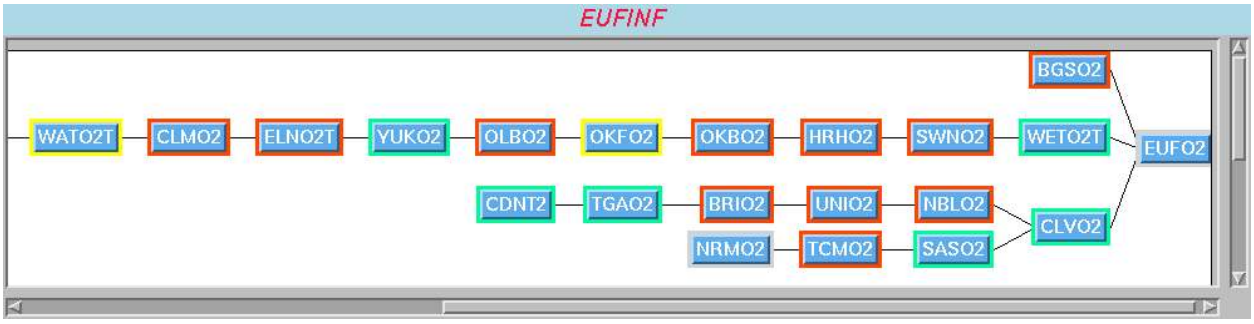


Figure 4

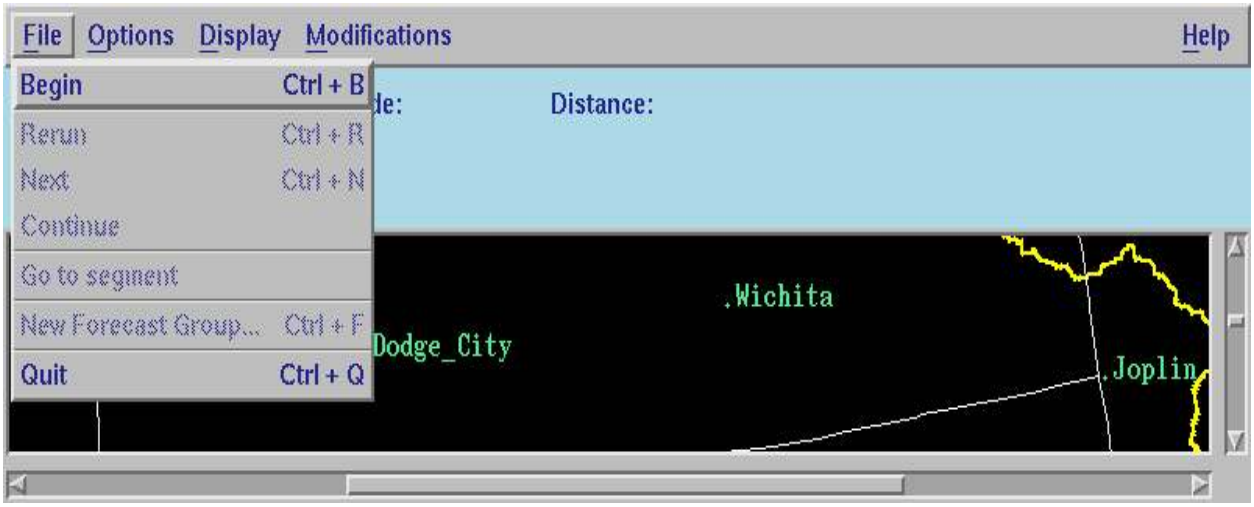
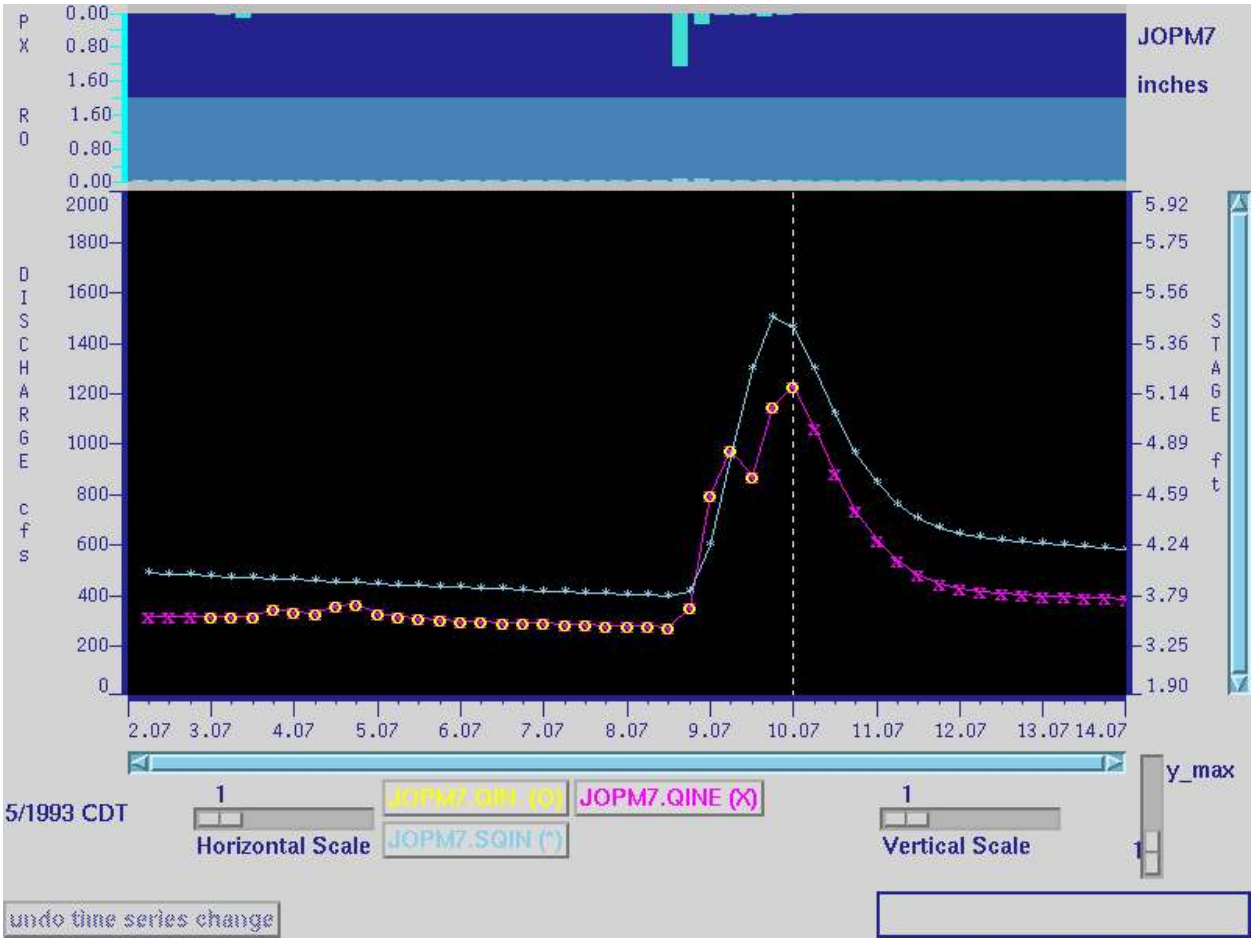


Figure 5

Figure 6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0.80
1.60
1.60
0.80
0.00
JOPM7
inches
DISCHARGE cfs
2000
1800
1600
1400
1200
1000
800
600
400
200
0
5.92
5.75
5.56
5.36
5.14
4.89
4.59
4.24
3.79
3.25
1.90
STAGE ft
2.07
3.07
4.07
5.07
6.07
7.07
8.07
9.07
10.07
11.07
12.07
13.07
14.07
y_max
5/1993 CDT
1
Horizontal Scale
JOPM7.QIN (O)
JOPM7.QINE (X)
JOPM7.SQIN (*)
1
Vertical Scale
1
undo time series change

Figure 7

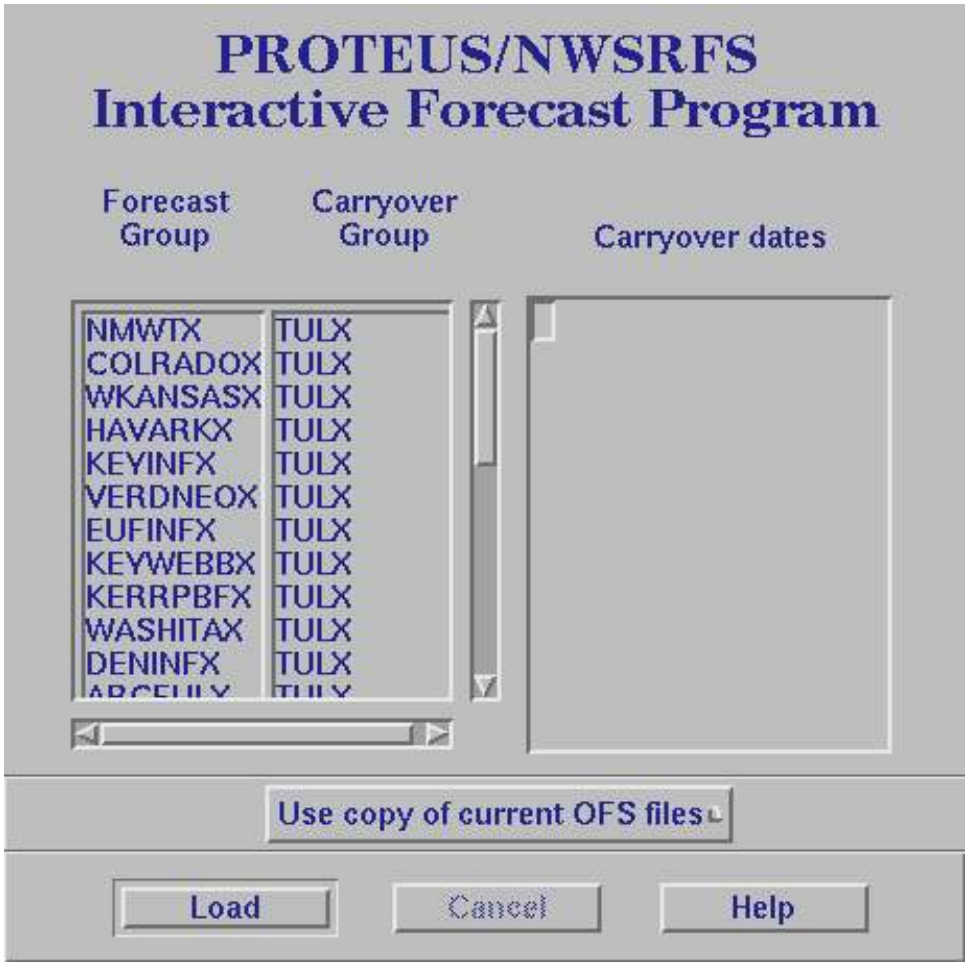
PROTEUS/NWSRFS
Interactive Forecast Program
Forecast Group
Carryover Group
Carryover dates
NMWTX TULX
COLRADOX TULX
WKANSASX TULX
HAVARKX TULX
KEYINFX TULX
VERDNEOX TULX
EUFINFX TULX
KEYWEBBX TULX
KERRPBFX TULX
WASHITAX TULX
DENINFX TULX
Use copy of current OFS files
Load
Cancel
Help

Figure 8

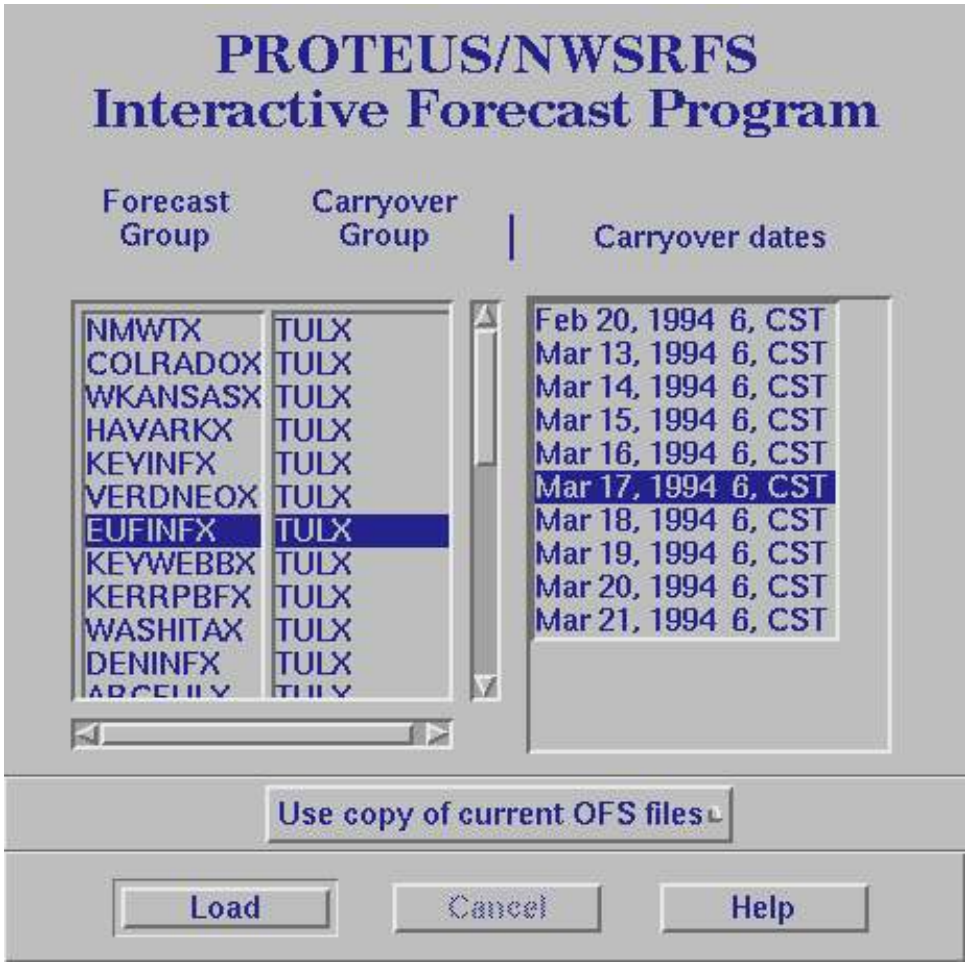
PROTEUS/NWSRFS
Interactive Forecast Program
Forecast Group
Carryover Group
Carryover dates
NMWTX TULX
COLRADOX TULX
WKANSASX TULX
HAVARKX TULX
KEYINFX TULX
VERDNEOX TULX
EUFINFX TULX
KEYWEBBX TULX
KERRPBFX TULX
WASHITAX TULX
DENINFX TULX
Feb 20, 1994 6, CST
Mar 13, 1994 6, CST
Mar 14, 1994 6, CST
Mar 15, 1994 6, CST
Mar 16, 1994 6, CST
Mar 17, 1994 6, CST
Mar 18, 1994 6, CST
Mar 19, 1994 6, CST
Mar 20, 1994 6, CST
Mar 21, 1994 6, CST
Use copy of current OFS files
Load
Cancel
Help

Figure 9

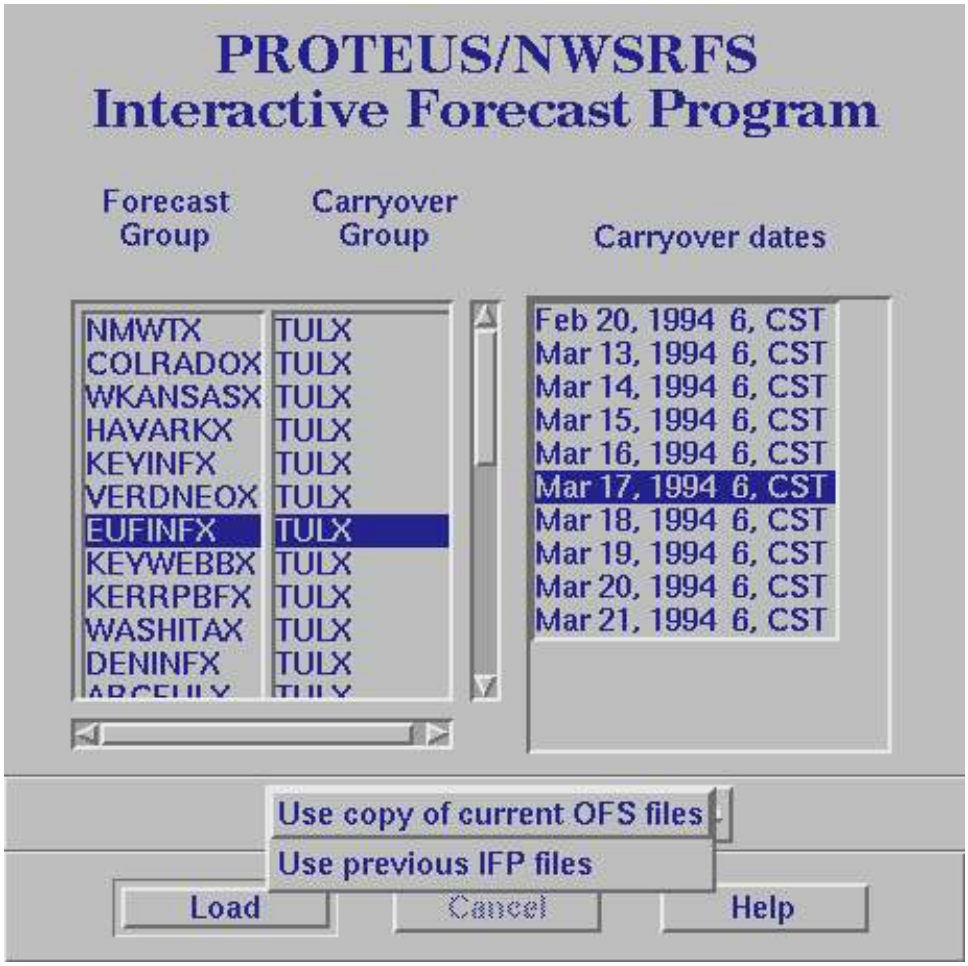
PROTEUS/NWSRFS
Interactive Forecast Program
Forecast Group
Carryover Group
Carryover dates
NMWTX TULX
COLRADOX TULX
WKANSASX TULX
HAVARKX TULX
KEYINFX TULX
VERDNEOX TULX
EUFINFX TULX
KEYWEBBX TULX
KERRPBFX TULX
WASHITAX TULX
DENINFX TULX
Feb 20, 1994 6, CST
Mar 13, 1994 6, CST
Mar 14, 1994 6, CST
Mar 15, 1994 6, CST
Mar 16, 1994 6, CST
Mar 17, 1994 6, CST
Mar 18, 1994 6, CST
Mar 19, 1994 6, CST
Mar 20, 1994 6, CST
Mar 21, 1994 6, CST
Use copy of current OFS files
Use previous IFP files
Load
Cancel
Help

Figure 10

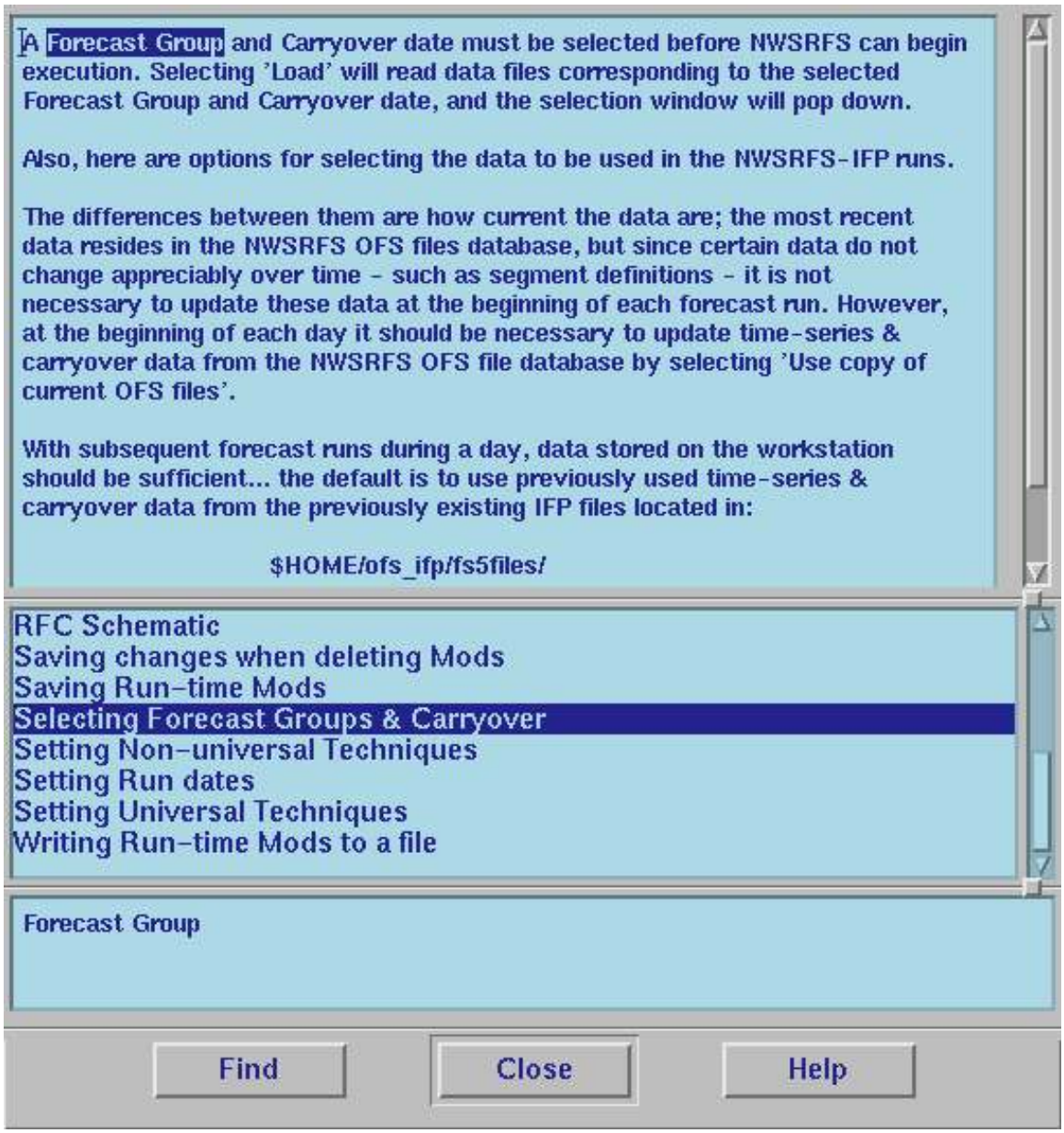
A Forecast Group and Carryover date must be selected before NWSRFS can begin execution. Selecting 'Load' will read data files corresponding to the selected Forecast Group and Carryover date, and the selection window will pop down.
Also, here are options for selecting the data to be used in the NWSRFS-IFP runs.
The differences between them are how current the data are; the most recent data resides in the NWSRFS OFS files database, but since certain data do not change appreciably over time - such as segment definitions - it is not necessary to update these data at the beginning of each forecast run. However, at the beginning of each day it should be necessary to update time-series & carryover data from the NWSRFS OFS file database by selecting 'Use copy of current OFS files'.
With subsequent forecast runs during a day, data stored on the workstation should be sufficient... the default is to use previously used time-series & carryover data from the previously existing IFP files located in:
$HOME/ofs_ifp/fs5files/
RFC Schematic
Saving changes when deleting Mods
Saving Run-time Mods
Selecting Forecast Groups & Carryover
Setting Non-universal Techniques
Setting Run dates
Setting Universal Techniques
Writing Run-time Mods to a file
Forecast Group
Find
Close
Help

Figure 11

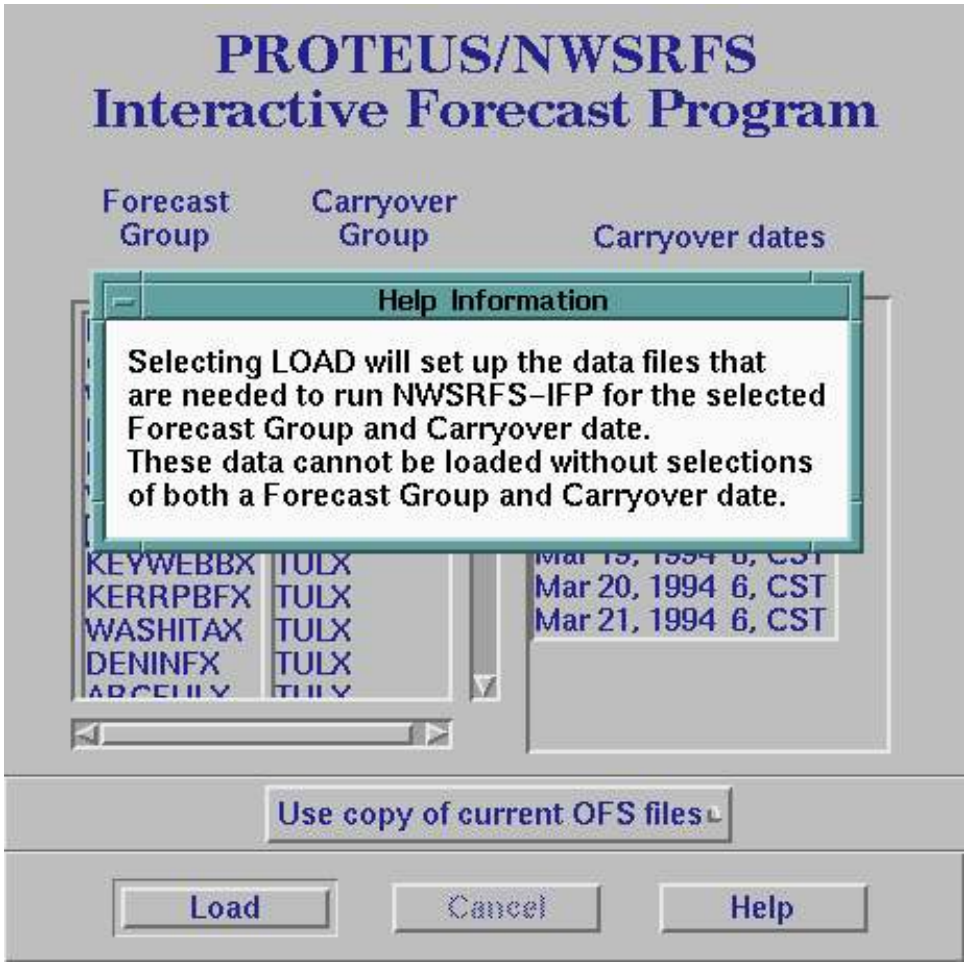
PROTEUS/NWSRFS
Interactive Forecast Program
Forecast Group
Carryover Group
Carryover dates
Help Information
Selecting LOAD will set up the data files that are needed to run NWSRFS-IFP for the selected Forecast Group and Carryover date.
These data cannot be loaded without selections of both a Forecast Group and Carryover date.
KEYWEBBX TULX
KERRPBFX TULX
WASHITAX TULX
DENINFX TULX
Mar 20, 1994 6, CST
Mar 21, 1994 6, CST
Use copy of current OFS files
Load
Cancel
Help

Figure 12

Figure 13

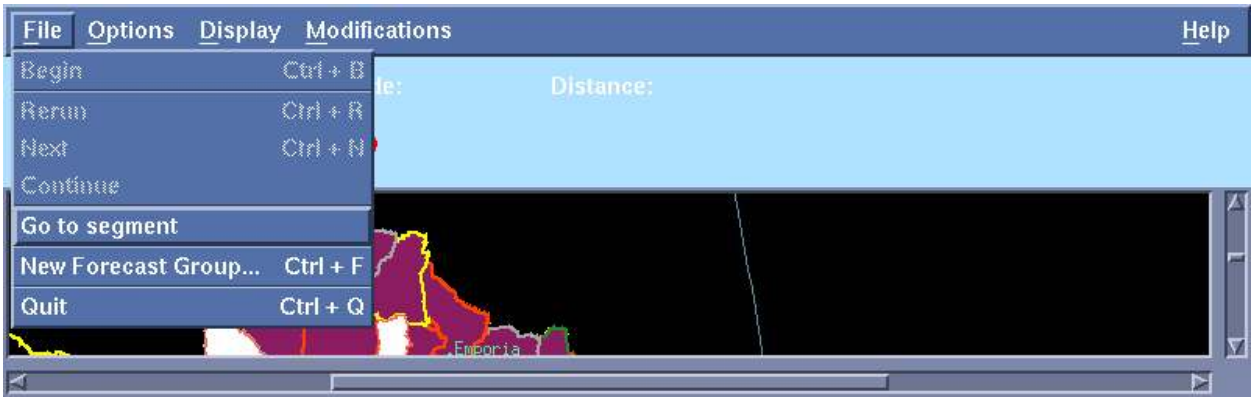

Figure 14

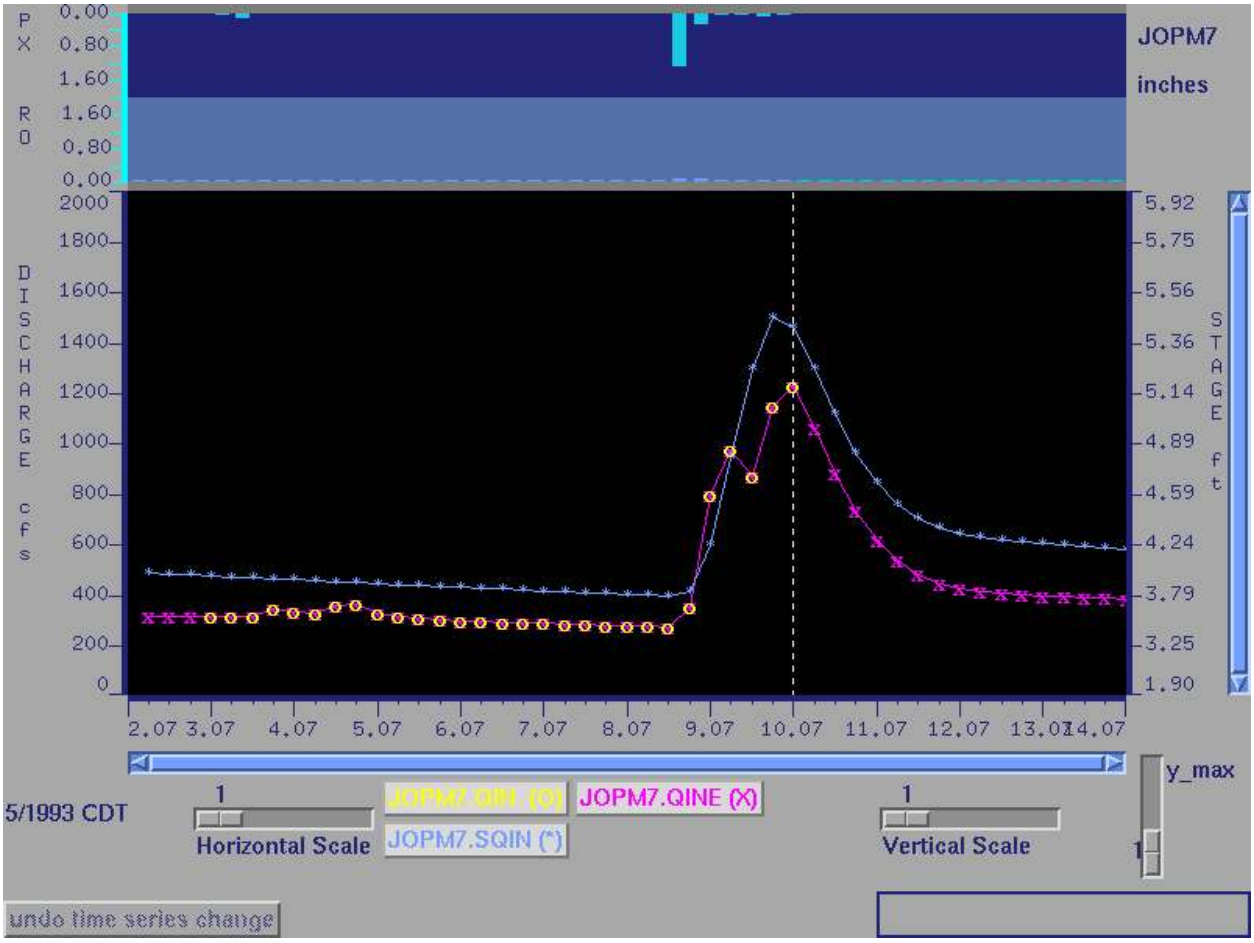
PX
RD
0.00
0.80
1.60
1.60
0.80
0.00
JOPM7
inches
DISCHARGE cfs
2000
1800
1600
1400
1200
1000
800
600
400
200
0
STAGE ft
5.92
5.75
5.56
5.36
5.14
4.89
4.59
4.24
3.79
3.25
1.90
2.07 3.07 4.07 5.07 6.07 7.07 8.07 9.07 10.07 11.07 12.07 13.07 14.07
5/1993 CDT
1
Horizontal Scale
JOPM7.QIN (O)
JOPM7.QINE (X)
JOPM7.SQIN (*)
1
Vertical Scale
y_max
1
undo time series change

Figure 15

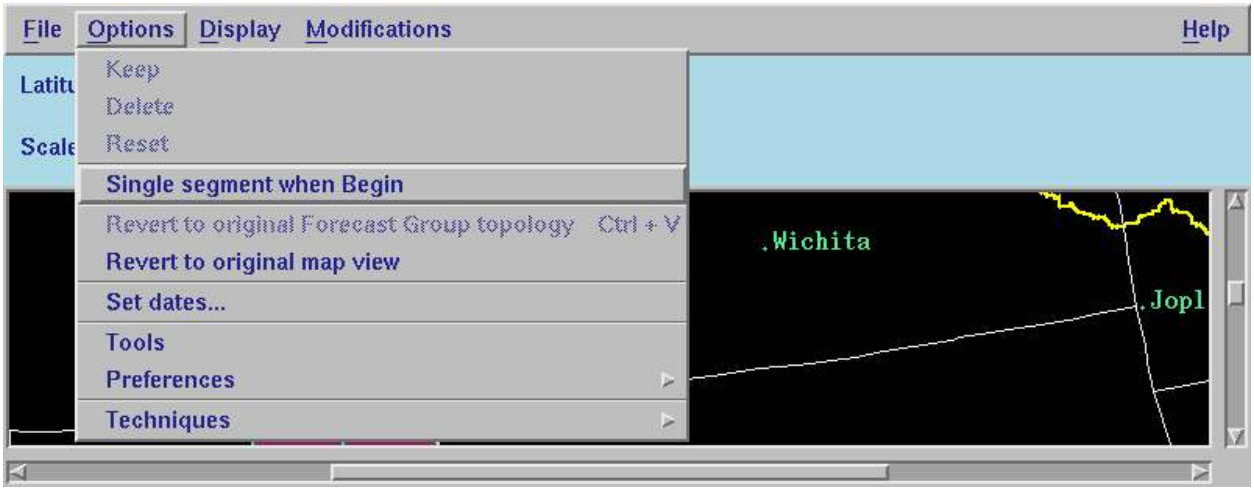

Figure 16

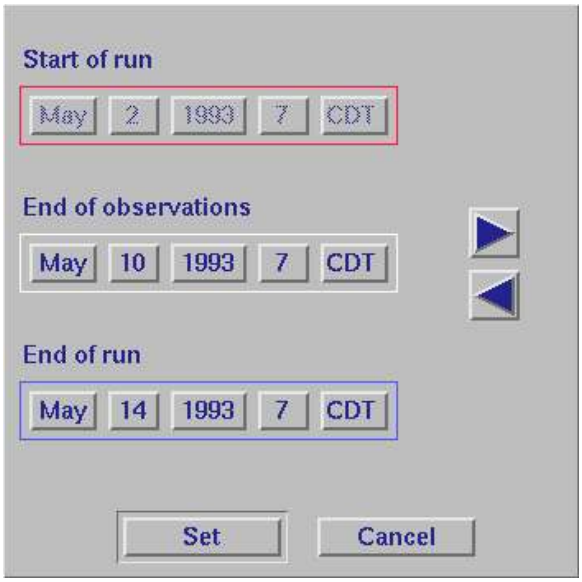

Figure 17

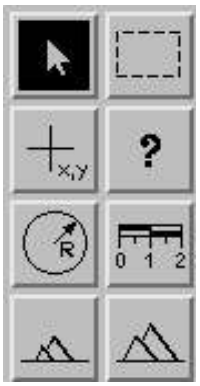

Figure 18

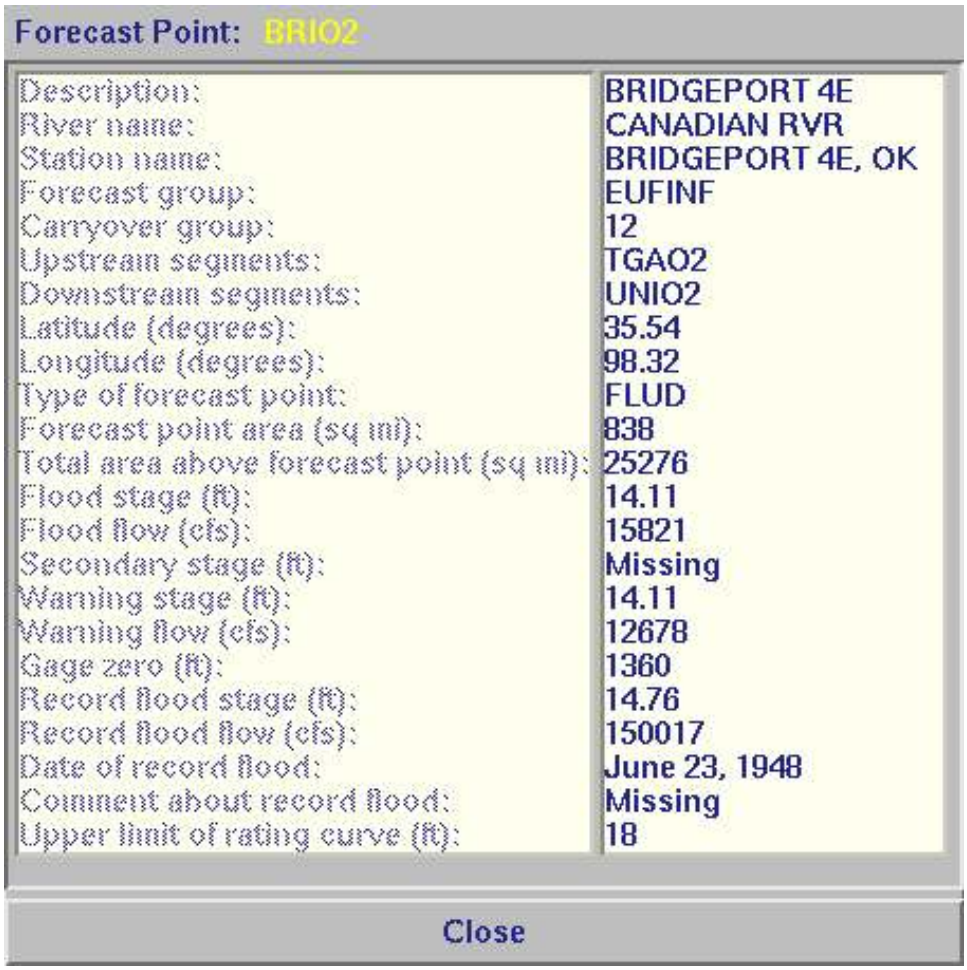
Forecast Point: BRIO2
Description: BRIDGEPORT 4E
River name: CANADIAN RVR
Station name: BRIDGEPORT 4E, OK
Forecast group: EUFINF
Carryover group: 12
Upstream segments: TGAO2
Downstream segments: UNIO2
Latitude (degrees): 35.54
Longitude (degrees): 98.32
Type of forecast point: FLUD
Forecast point area (sq mi): 838
Total area above forecast point (sq mi): 25276
Flood stage (ft): 14.11
Flood flow (cfs): 15821
Secondary stage (ft): Missing
Warning stage (ft): 14.11
Warning flow (cfs): 12678
Gage zero (ft): 1360
Record flood stage (ft): 14.76
Record flood flow (cfs): 150017
Date of record flood: June 23, 1948
Comment about record flood: Missing
Upper limit of rating curve (ft): 18
Close

Figure 19

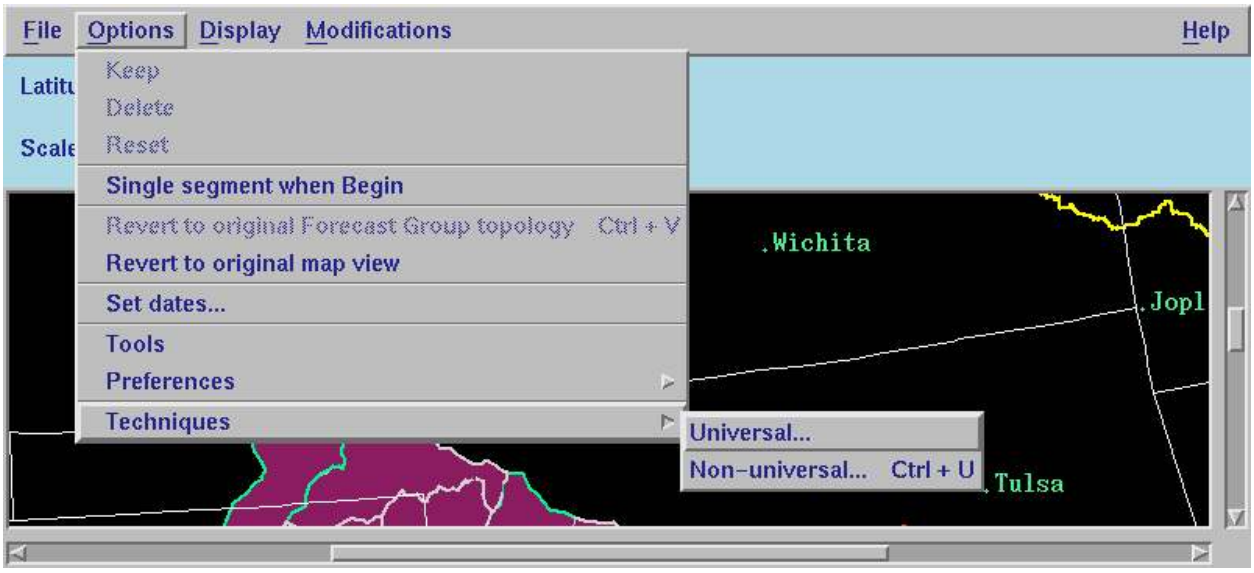

Figure 20

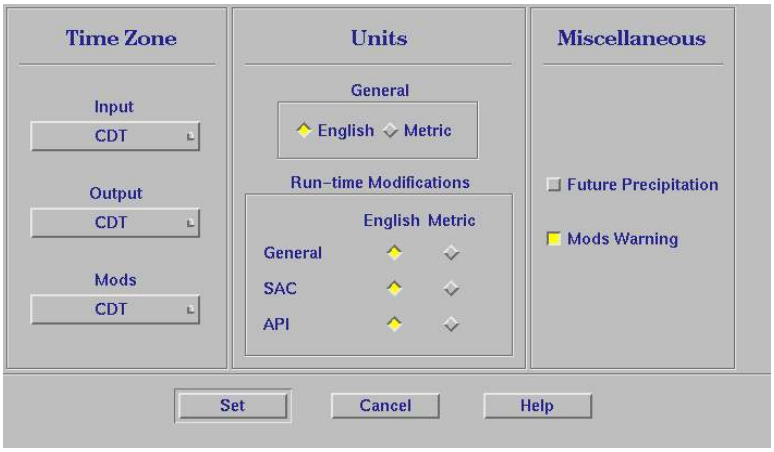

Figure 21

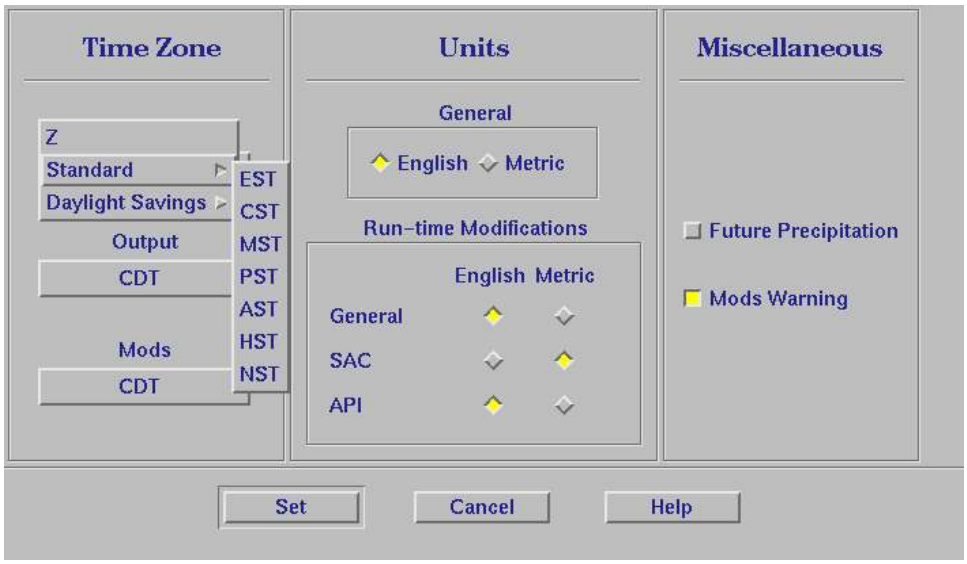

Figure 22

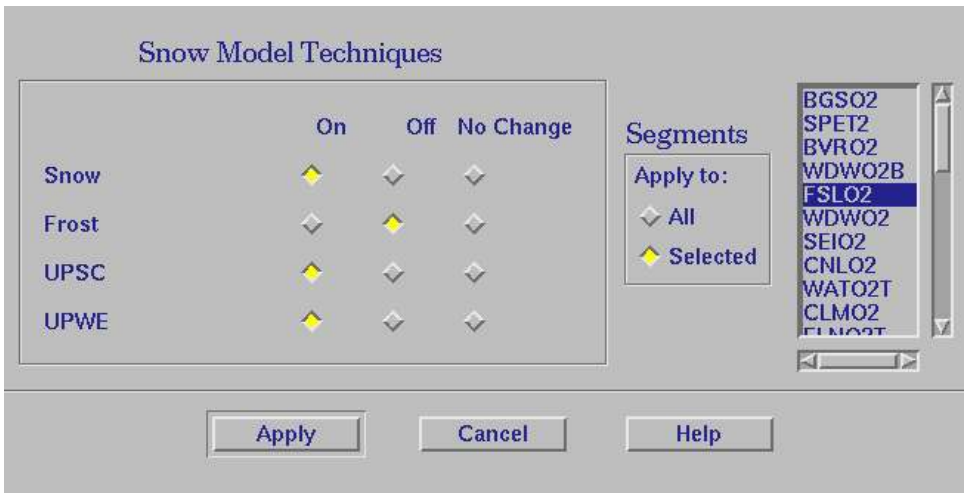

Figure 23

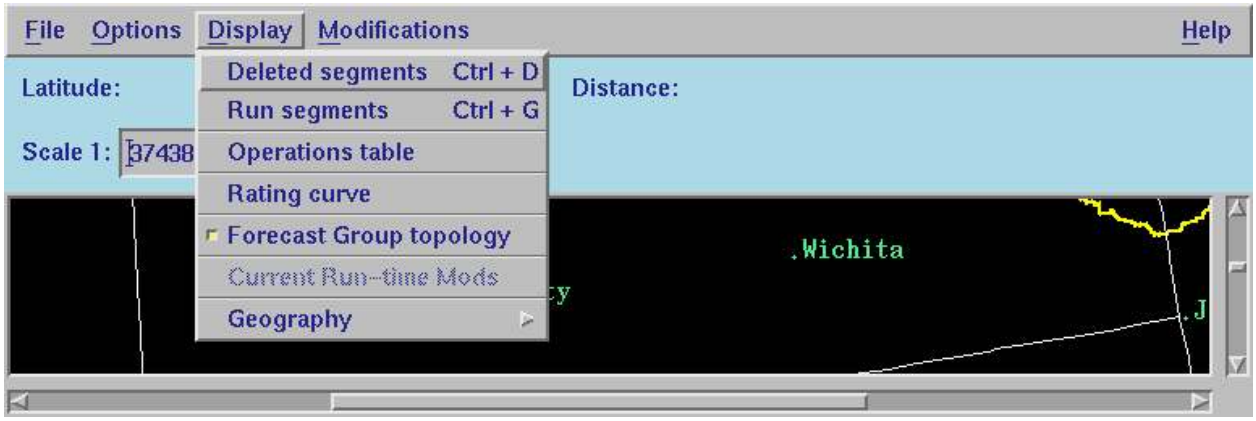

Figure 24

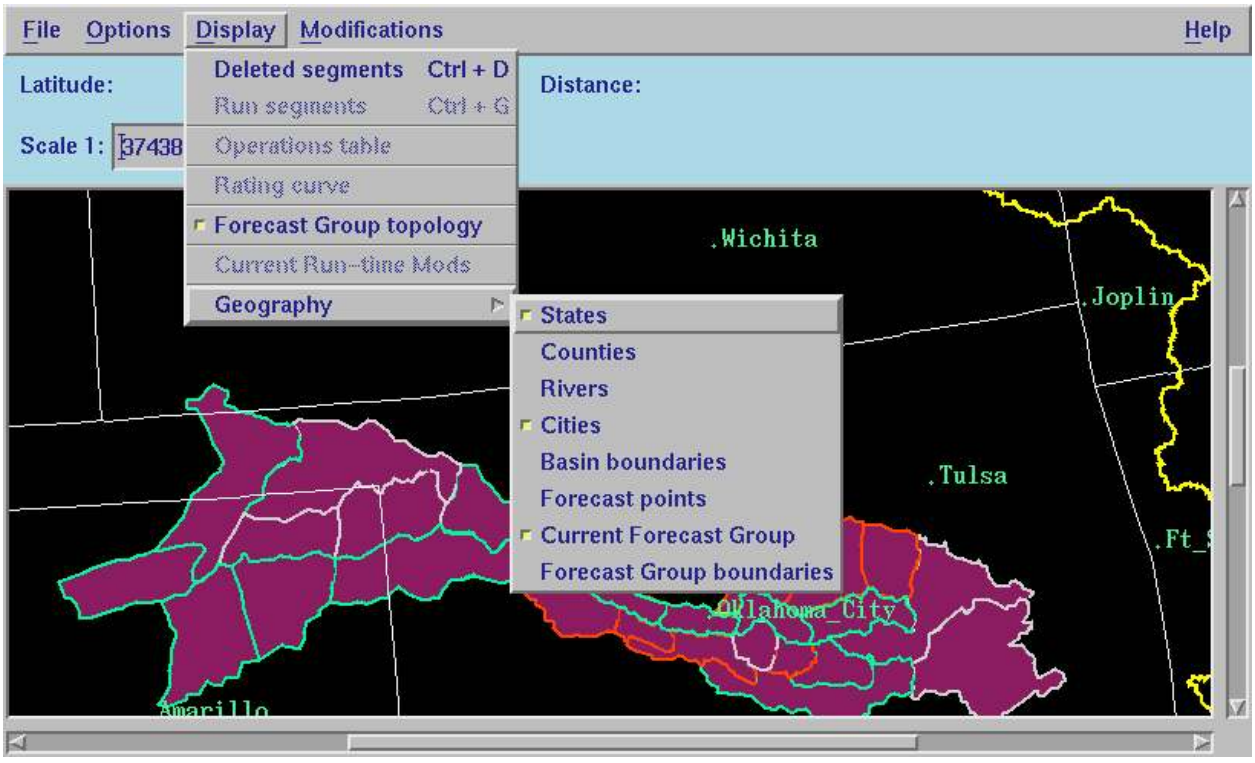

Figure 25

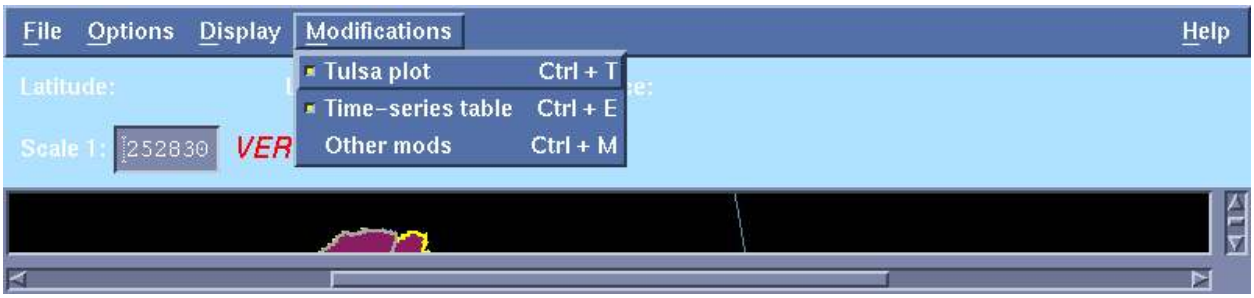

Figure 26

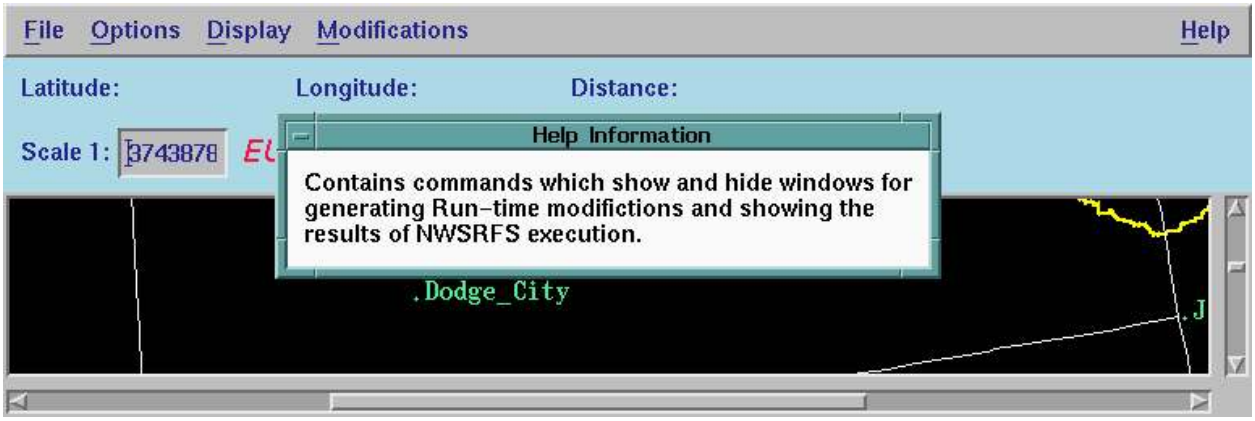

Figure 27

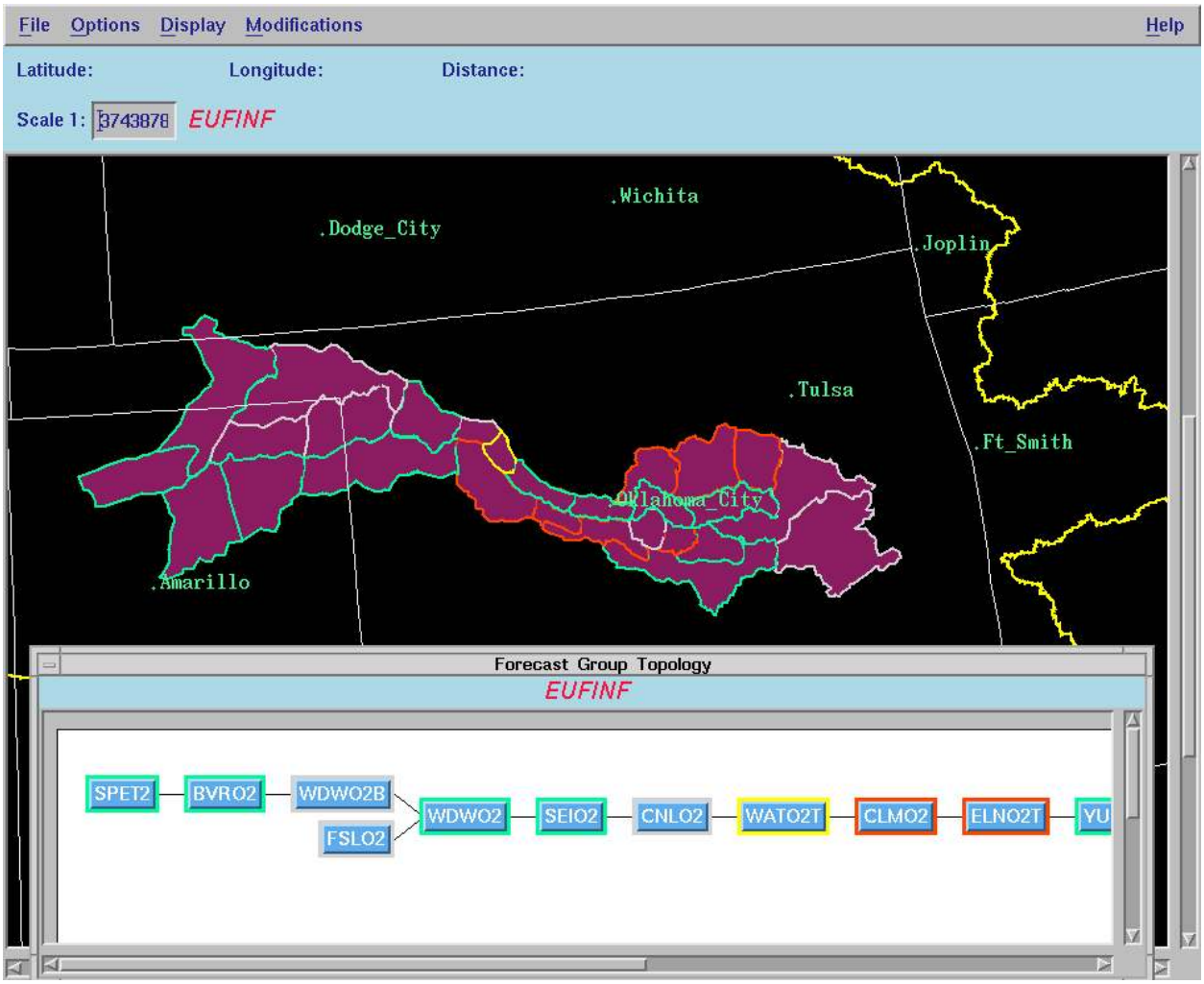
File Options Display Modifications Help
Latitude:
Longitude:
Distance:
Scale 1: 3743878
EUFINF
.Wichita
.Dodge_City
.Joplin
.Tulsa
.Ft_Smith
.Oklahoma City
.Amarillo
Forecast Group Topology
EUFINF
SPET2
BVRO2
WDWO2B
FSLO2
WDWO2
SEIO2
CNLO2
WATO2T
CLMO2
ELNO2T
YU

Figure 28

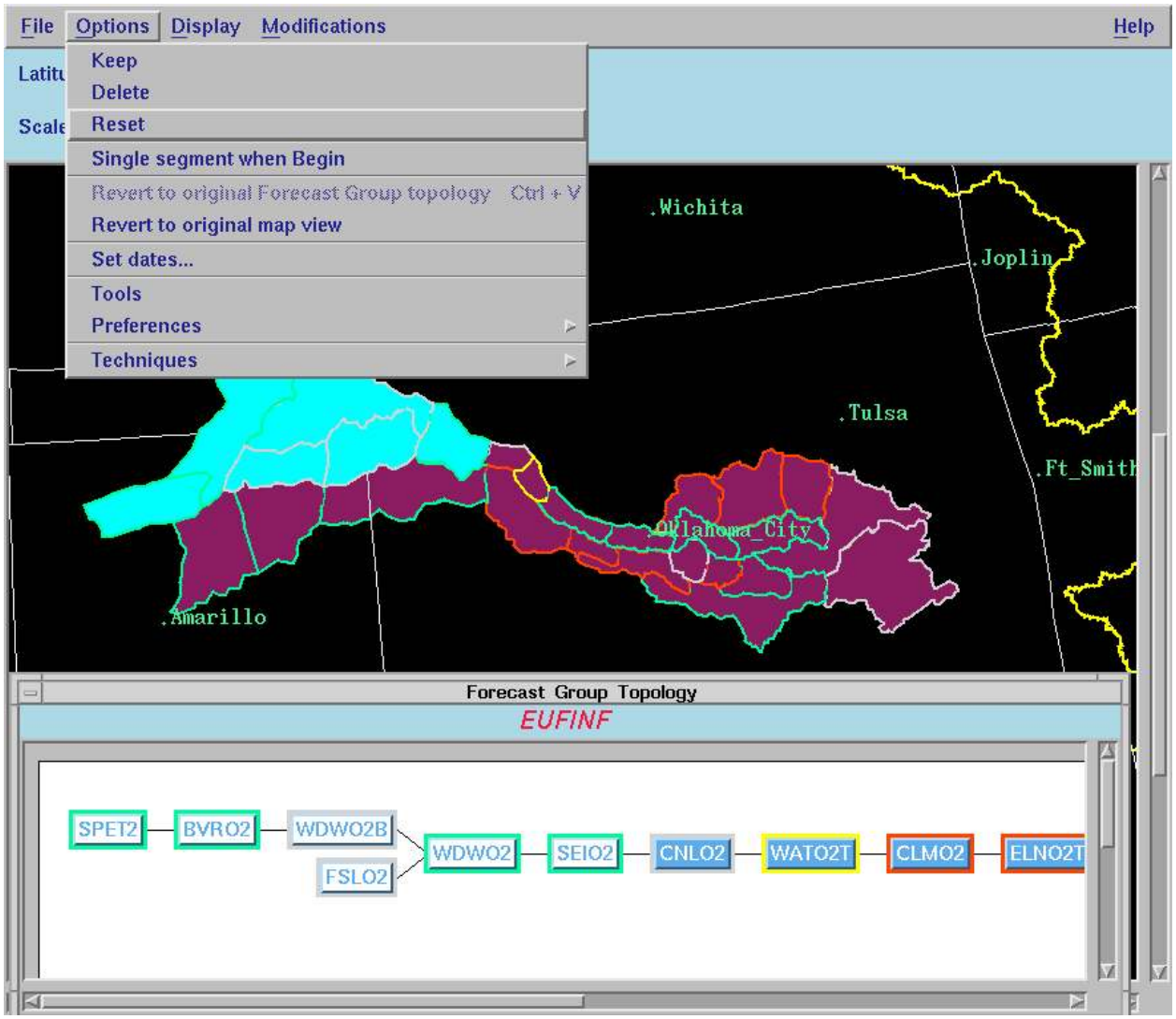
File
Options
Display
Modifications
Help
Keep
Delete
Reset
Single segment when Begin
Revert to original Forecast Group topology Ctrl + V
Revert to original map view
Set dates...
Tools
Preferences
Techniques
.Wichita
.Joplin
.Tulsa
.Ft_Smith
.Oklahoma_City
.Amarillo
Forecast Group Topology
EUFINF
SPET2
BVRO2
WDWO2B
FSLO2
WDWO2
SEIO2
CNLO2
WATO2T
CLMO2
ELNO2T

Figure 29

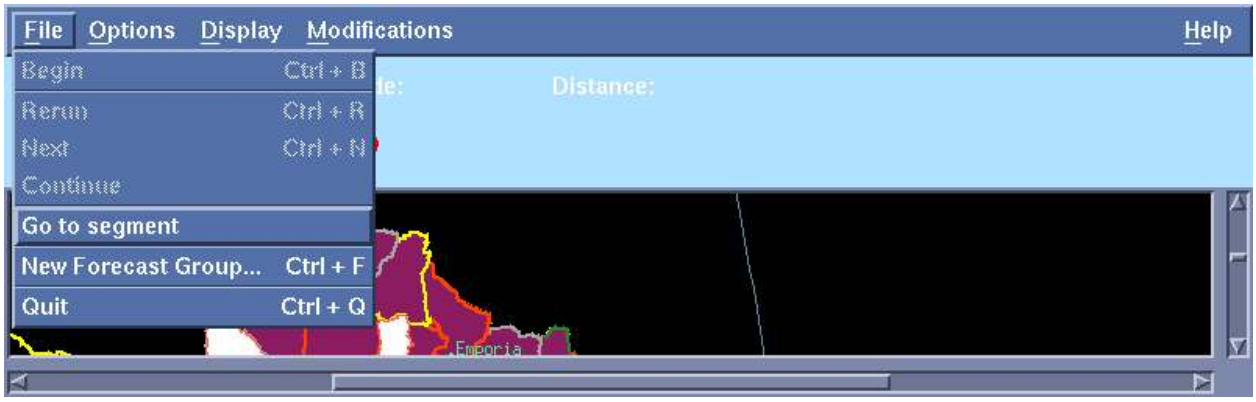

Figure 30

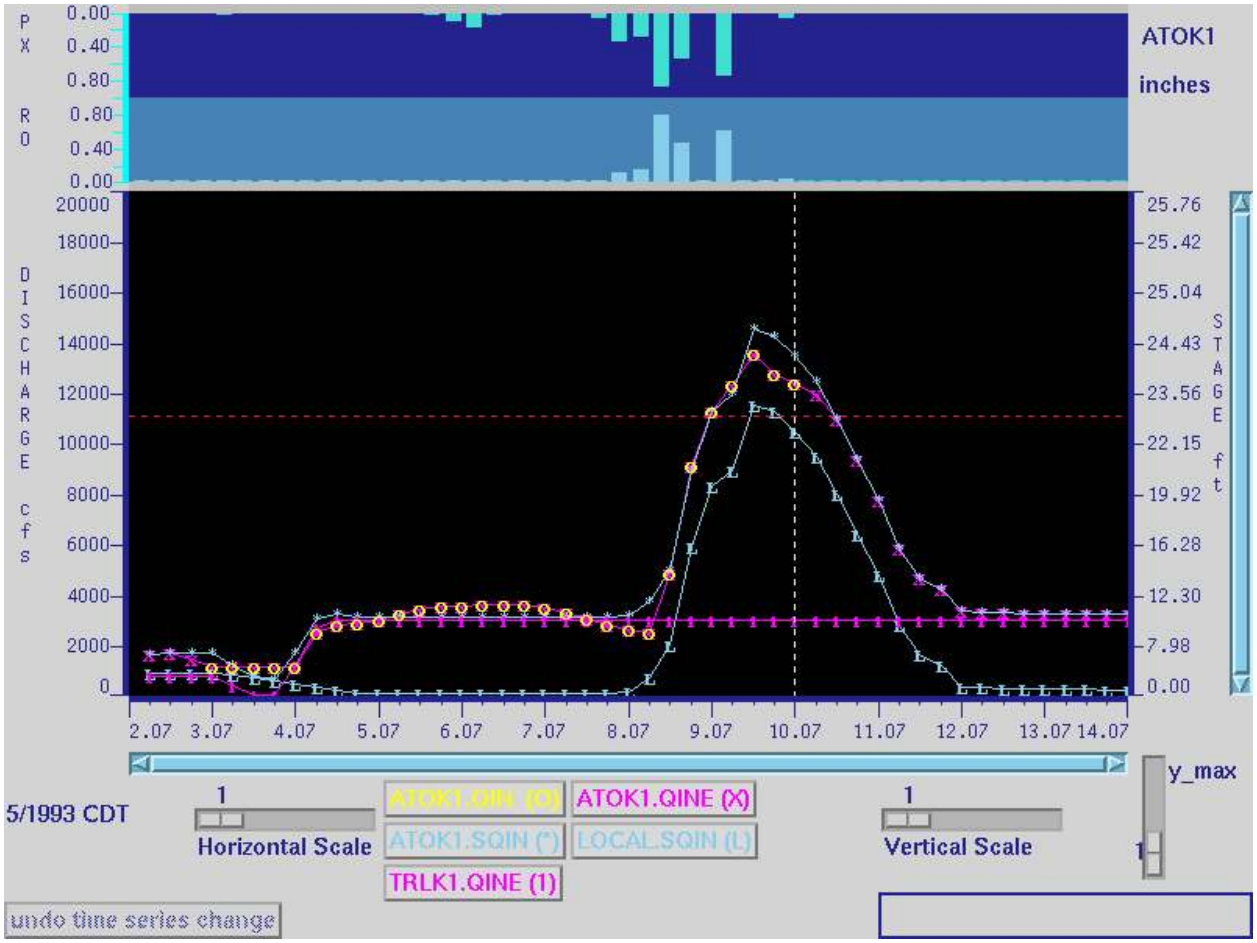

Figure 31

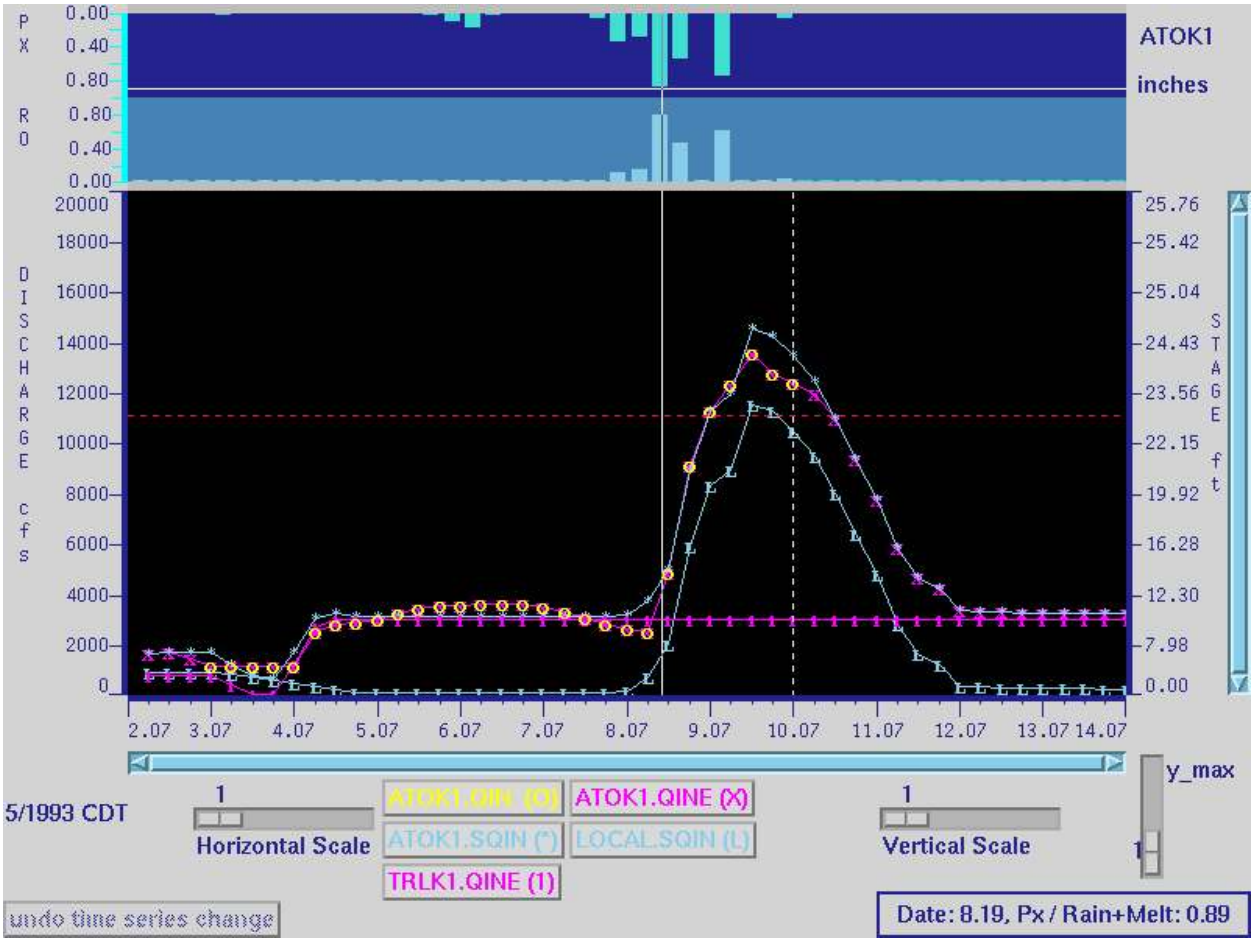
PX
RO
0.00
0.40
0.80
0.80
0.40
0.00
ATOK1
inches
DISCHARGE cfs
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
25.76
25.42
25.04
24.43
23.56
22.15
19.92
16.28
12.30
7.98
0.00
STAGE ft
2.07
3.07
4.07
5.07
6.07
7.07
8.07
9.07
10.07
11.07
12.07
13.07
14.07
y_max
5/1993 CDT
1
Horizontal Scale
ATOK1.QIN (O)
ATOK1.QINE (X)
ATOK1.SQIN (*)
LOCAL.SQIN (L)
TRLK1.QINE (1)
1
Vertical Scale
1
undo time series change
Date: 8.19, Px / Rain+Melt: 0.89

Figure 32

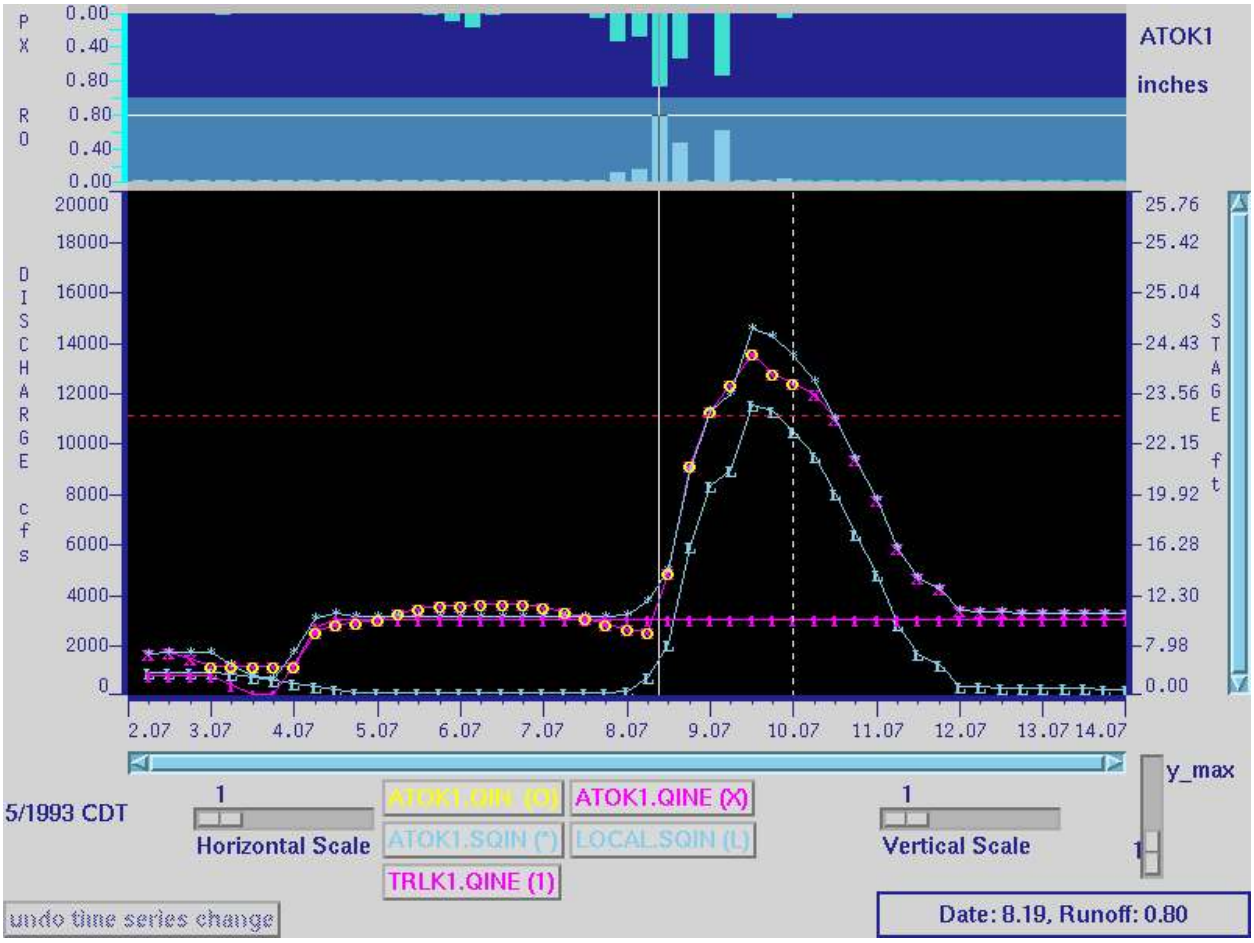
PX
RO
0.00
0.40
0.80
0.80
0.40
0.00
ATOK1
inches
DISCHARGE cfs
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
25.76
25.42
25.04
24.43
23.56
22.15
19.92
16.28
12.30
7.98
0.00
STAGE ft
2.07
3.07
4.07
5.07
6.07
7.07
8.07
9.07
10.07
11.07
12.07
13.07
14.07
y_max
5/1993 CDT
1
Horizontal Scale
ATOK1.QIN (O)
ATOK1.QINE (X)
ATOK1.SQIN (*)
LOCAL.SQIN (L)
TRLK1.QINE (1)
1
Vertical Scale
1
undo time series change
Date: 8.19, Runoff: 0.80

Figure 33

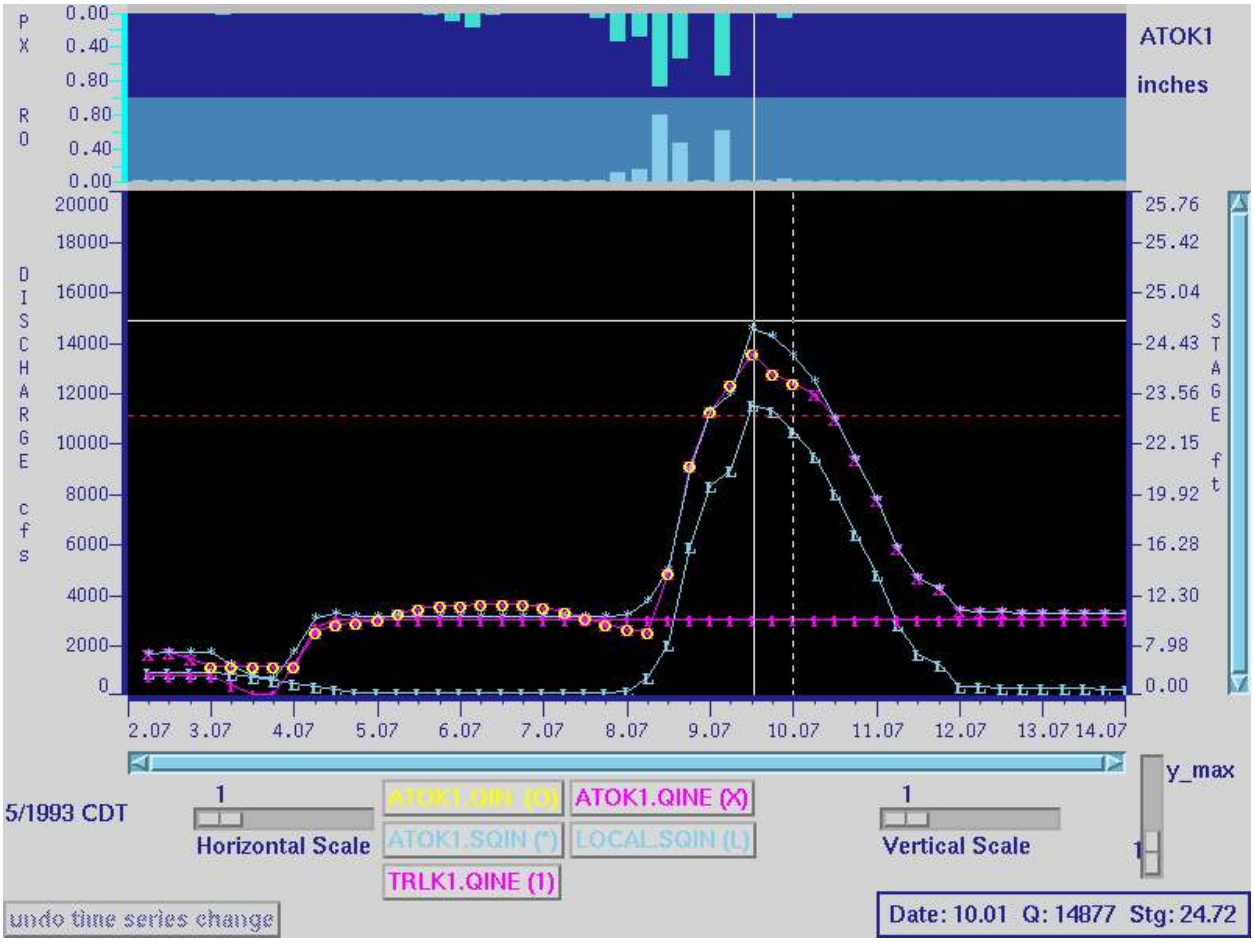
PX
RO
0.00
0.40
0.80
0.80
0.40
0.00
ATOK1
inches
DISCHARGE cfs
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
25.76
25.42
25.04
24.43
23.56
22.15
19.92
16.28
12.30
7.98
0.00
STAGE ft
2.07 3.07 4.07 5.07 6.07 7.07 8.07 9.07 10.07 11.07 12.07 13.07 14.07
y_max
5/1993 CDT
1
Horizontal Scale
ATOK1.QIN (O)
ATOK1.QINE (X)
ATOK1.SQIN (*)
LOCAL.SQIN (L)
TRLK1.QINE (1)
1
Vertical Scale
1
undo time series change
Date: 10.01 Q: 14877 Stg: 24.72

Figure 34

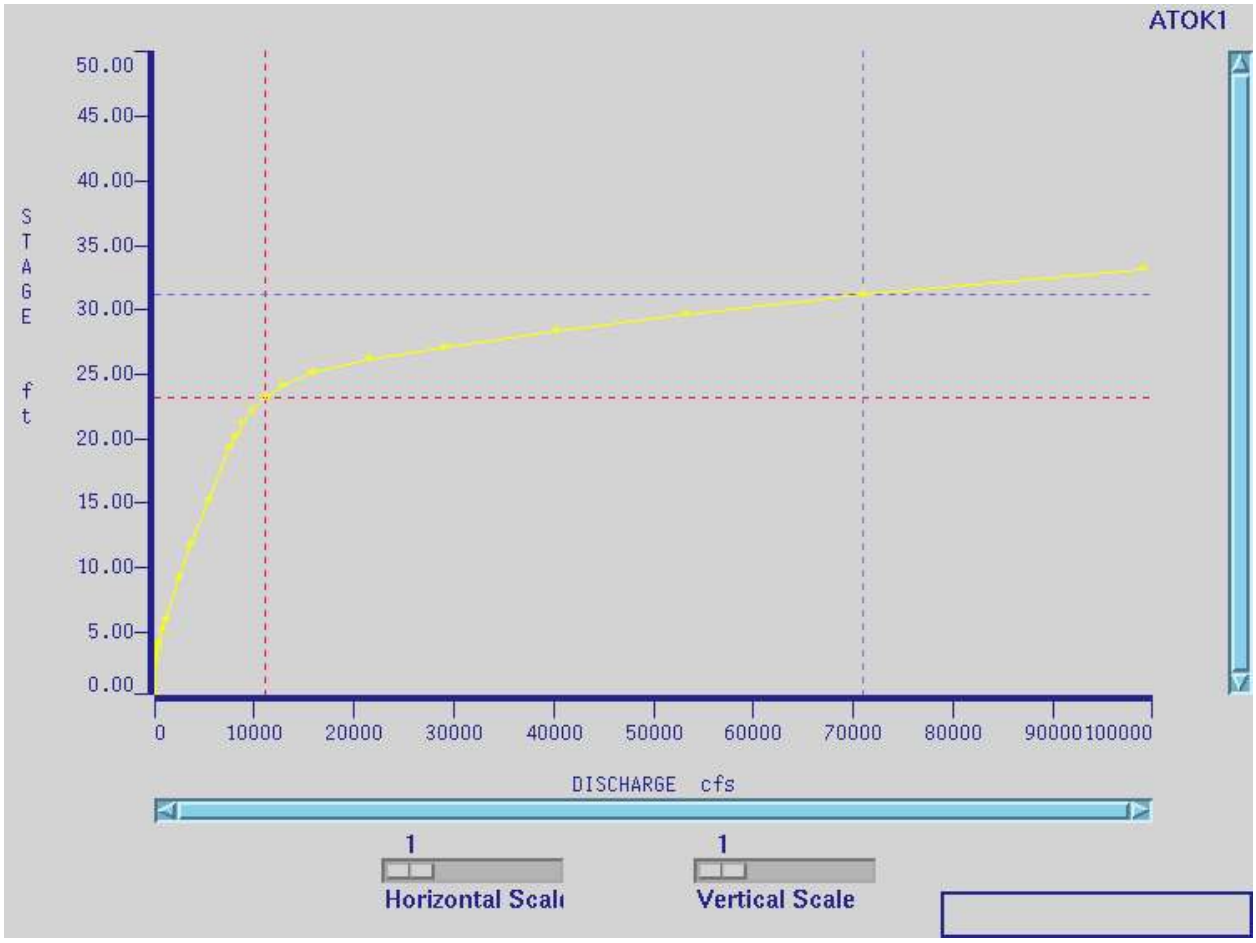
ATOK1
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
STAGE
ft
0
10000
20000
30000
40000
50000
60000
70000
80000
90000
100000
DISCHARGE cfs
1
Horizontal Scal
1
Vertical Scale

Figure 35

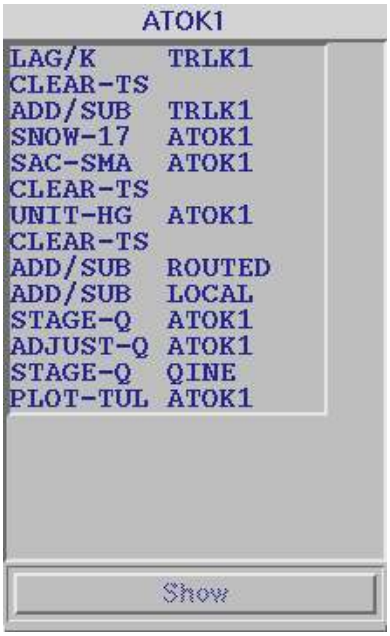

Figure 36

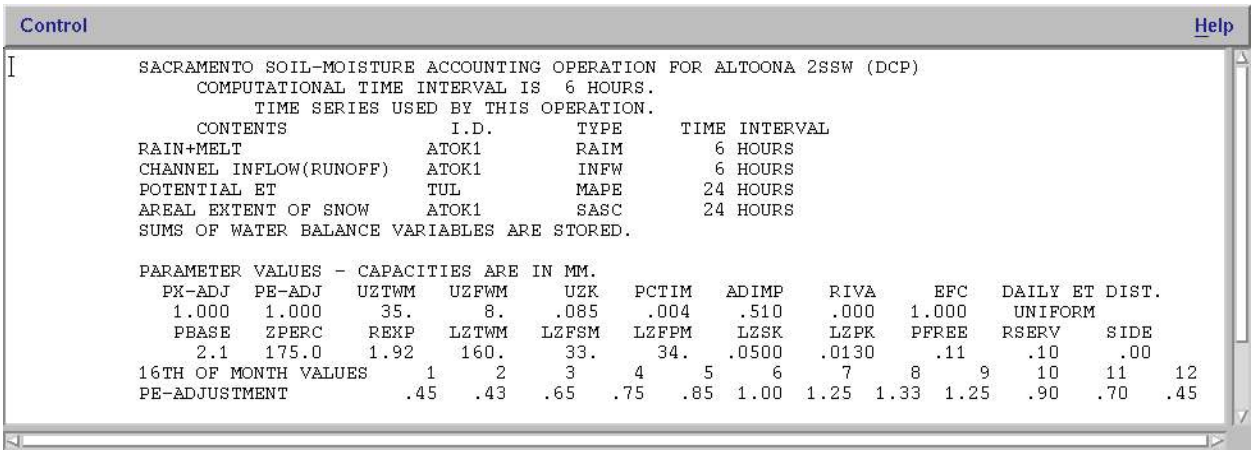

Figure 37

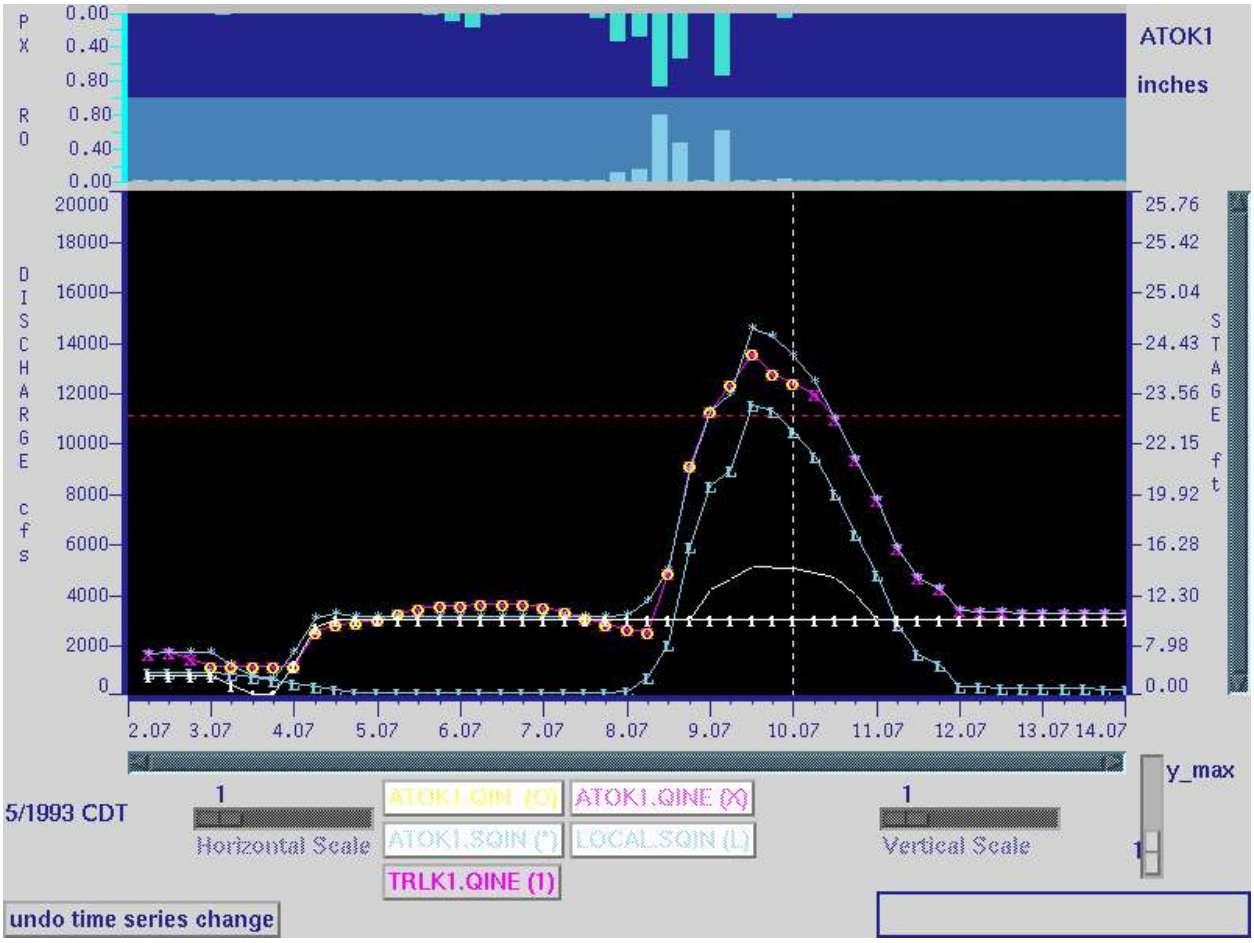
PX
RO
0.00
0.40
0.80
0.80
0.40
0.00
ATOK1
inches
DISCHARGE cfs
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
25.76
25.42
25.04
24.43
23.56
22.15
19.92
16.28
12.30
7.98
0.00
STAGE ft
2.07
3.07
4.07
5.07
6.07
7.07
8.07
9.07
10.07
11.07
12.07
13.07
14.07
y_max
5/1993 CDT
1
Horizontal Scale
ATOK1.QINE (O)
ATOK1.QINE (X)
ATOK1.SQIN (*)
LOCAL.SQIN (L)
TRLK1.QINE (1)
1
Vertical Scale
1
undo time series change

Figure 38

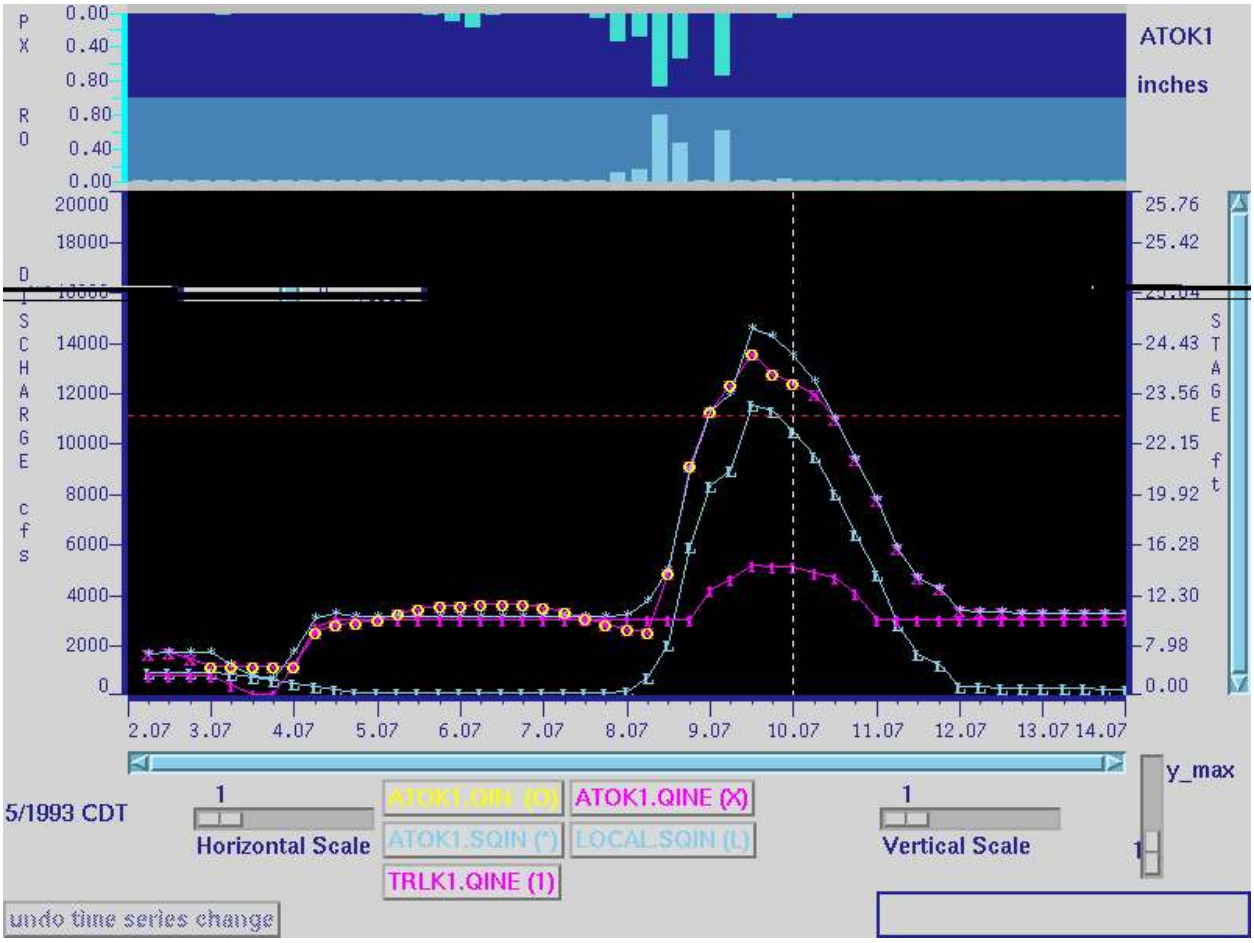
PX
RO
0.00
0.40
0.80
0.80
0.40
0.00
ATOK1
inches
DISCHARGE cfs
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
25.76
25.42
24.43
23.56
22.15
19.92
16.28
12.30
7.98
0.00
STAGE ft
2.07
3.07
4.07
5.07
6.07
7.07
8.07
9.07
10.07
11.07
12.07
13.07
14.07
y_max
5/1993 CDT
1
Horizontal Scale
ATOK1.QIN (O)
ATOK1.QINE (X)
ATOK1.SQIN (*)
LOCAL.SQIN (L)
TRLK1.QINE (1)
1
Vertical Scale
1
undo time series change

Figure 39

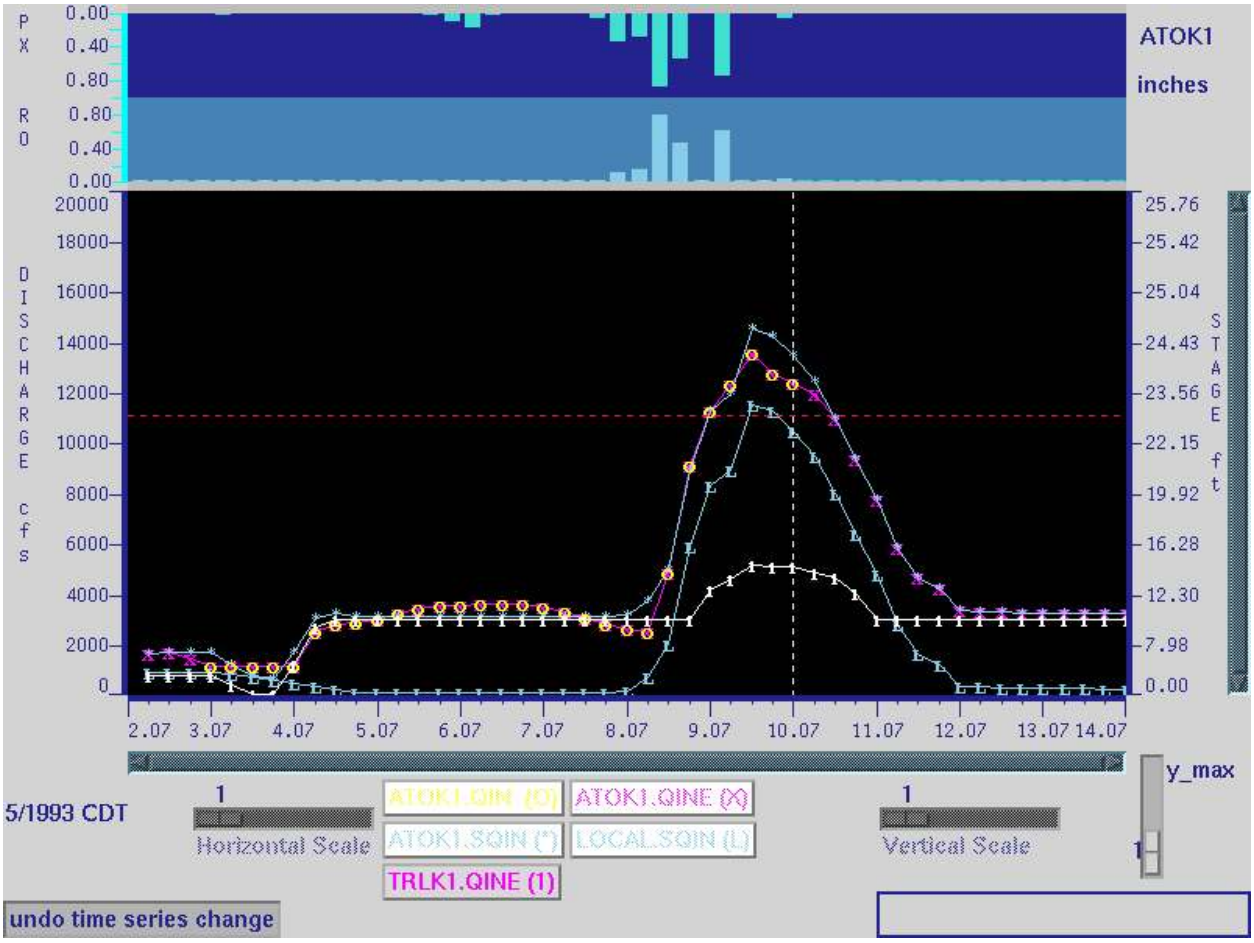
PX
RO
0.00
0.40
0.80
0.80
0.40
0.00
ATOK1
inches
DISCHARGE cfs
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
25.76
25.42
25.04
24.43
23.56
22.15
19.92
16.28
12.30
7.98
0.00
STAGE ft
2.07
3.07
4.07
5.07
6.07
7.07
8.07
9.07
10.07
11.07
12.07
13.07
14.07
y_max
5/1993 CDT
1
Horizontal Scale
ATOK1.QINE (O)
ATOK1.QINE (X)
ATOK1.SQIN (*)
LOCAL.SQIN (L)
TRLK1.QINE (1)
1
Vertical Scale
1
undo time series change

Figure 40


tultable
Day Hour | ATOK1.SSTG | ATOK1.QINE
7 07 | 11.28 | 3518.17
7 13 | 10.84 | 3307.94
7 19 | 10.29 | 15000
8 01 | 9.78 | 2820.66
8 07 | 9.31 | 2613.53
8 13 | 9.05 | 2501.37
8 19 | 13.98 | 4828.90
9 01 | 21.28 | 9115.98
9 07 | 23.12 | 11289.70
9 13 | 23.76 | 12339.49
9 19 | 24.27 | 13521.88
10 01 | 24.00 | 12750.00
10 07 | 23.80 | 12407.26
PX RO
DISCHARGE cfs
0.00 0.40 0.80 0.80 0.40 0.00
20000 18000 16000 14000 12000 10000 8000 6000 4000 2000 0
12.30 7.98 0.00
2.07 3.07 4.07 5.07 6.07 7.07 8.07 9.07 10.07 11.07 12.07 13.07 14.07
5/1993 CDT
1
Horizontal Scale
ATOK1.QIN (O)
ATOK1.QINE (X)
ATOK1.SQIN (*)
LOCAL.SQIN (L)
TRLK1.QINE (1)
1
Vertical Scale
y_max
1
undo time series change

Figure 41

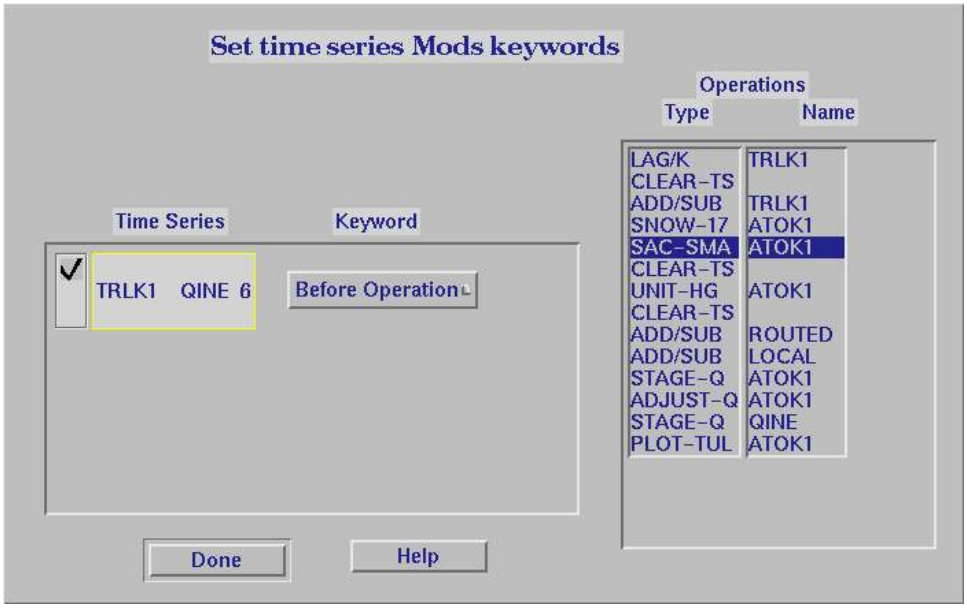

Figure 42

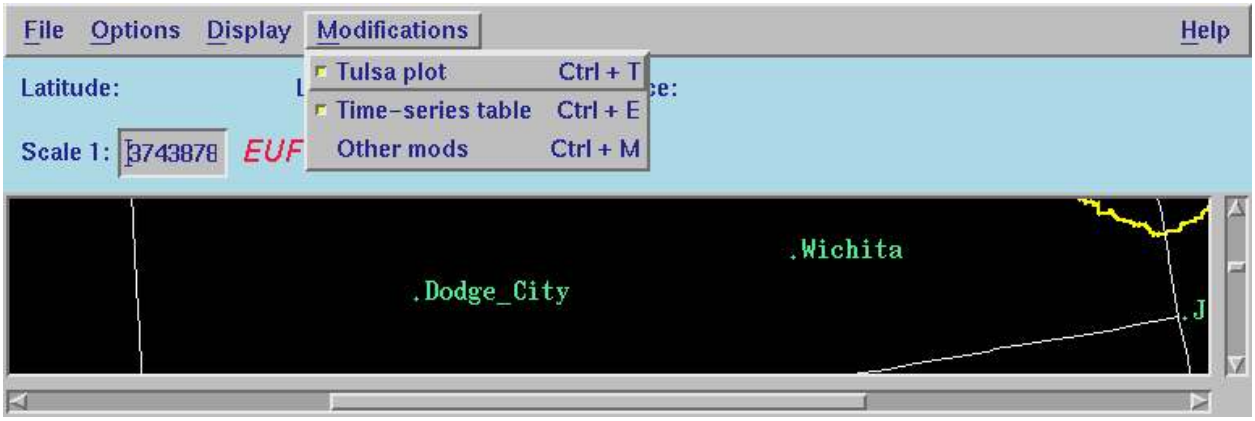

Figure 43

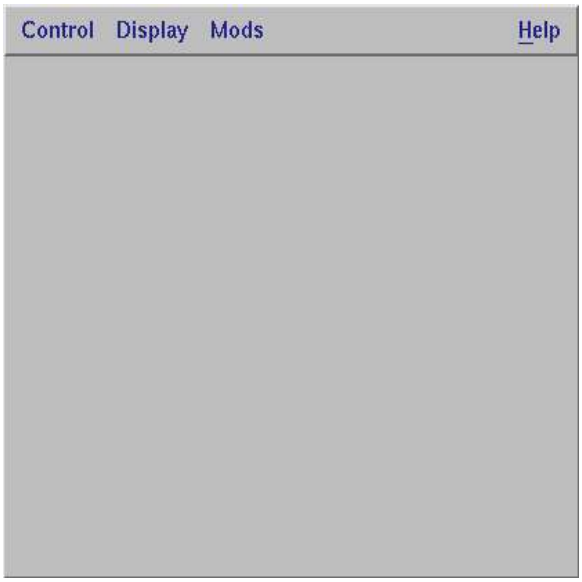

Figure 44

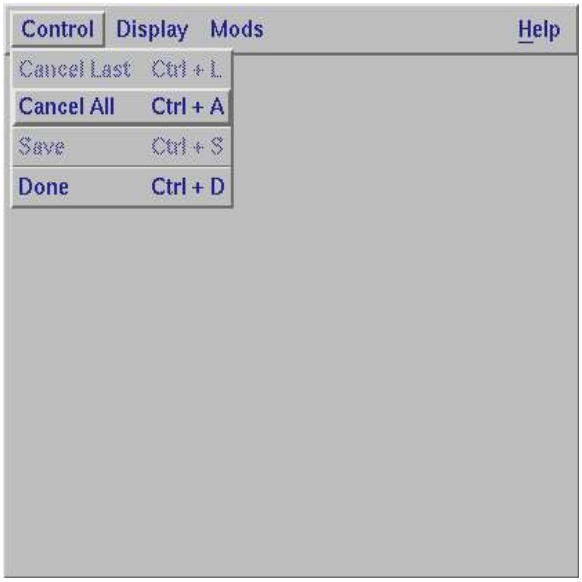

Figure 45

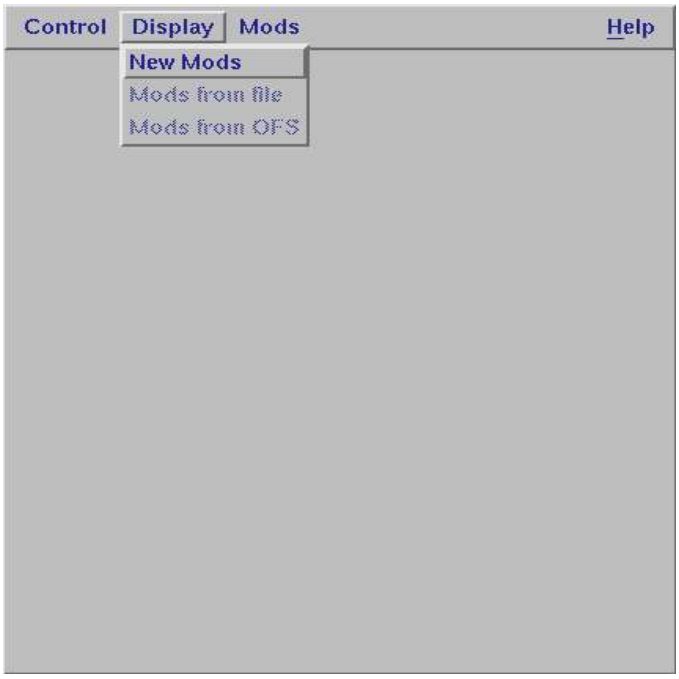

Figure 46

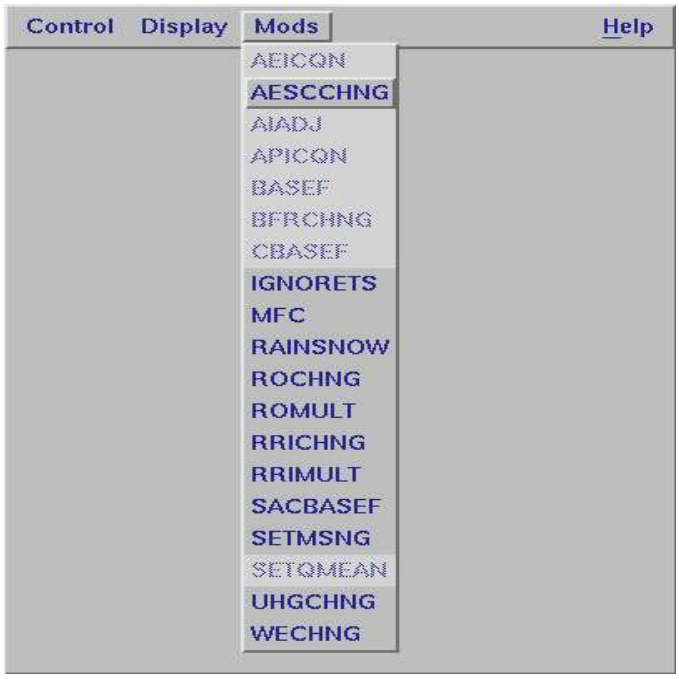

Figure 47

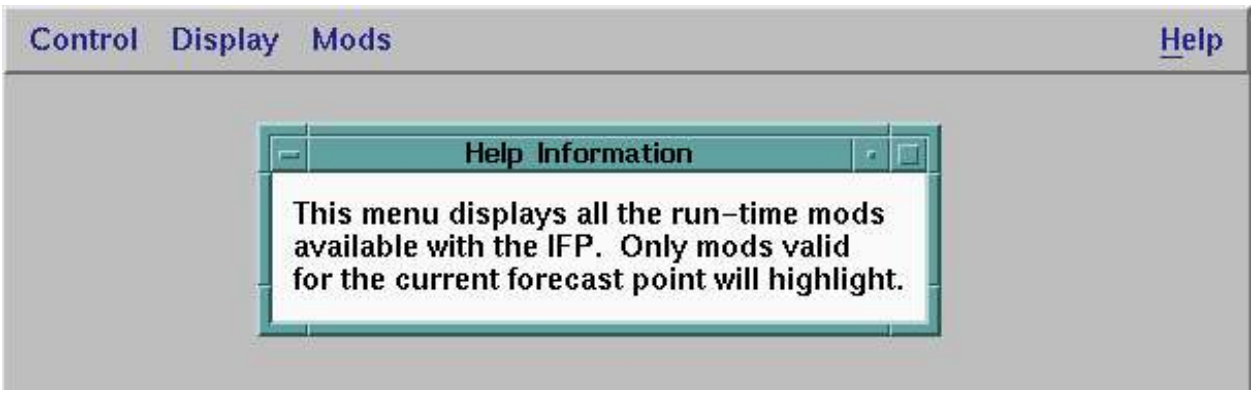

Figure 48 not included

Figure 49

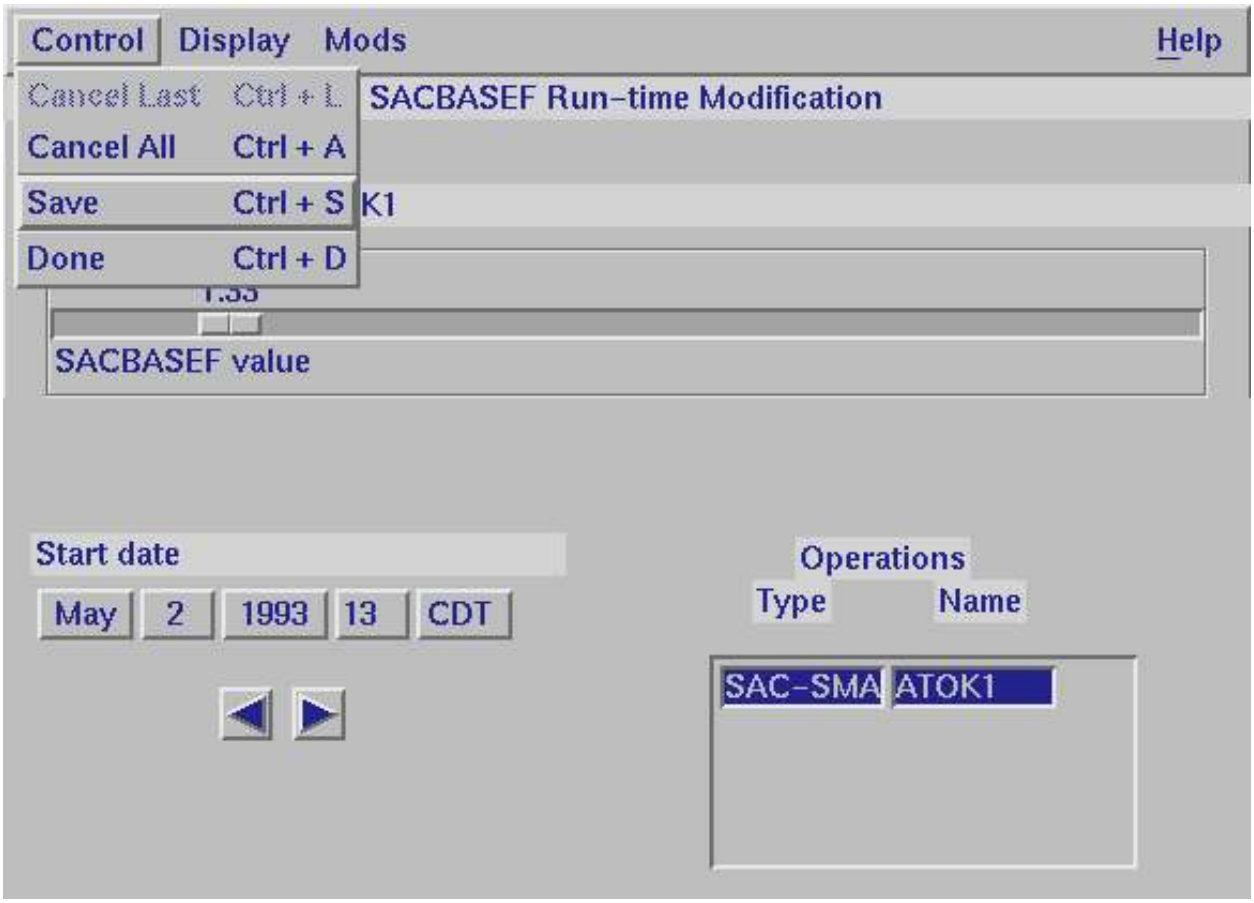

Figure 50

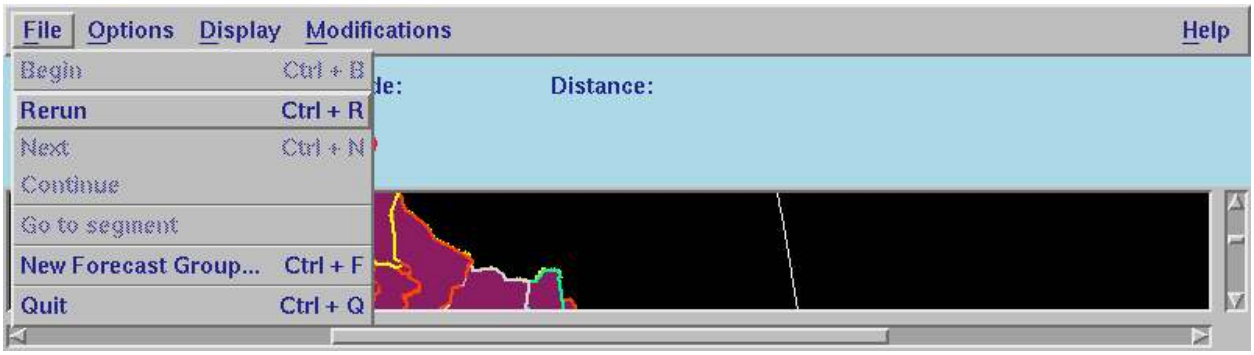

Figure 51

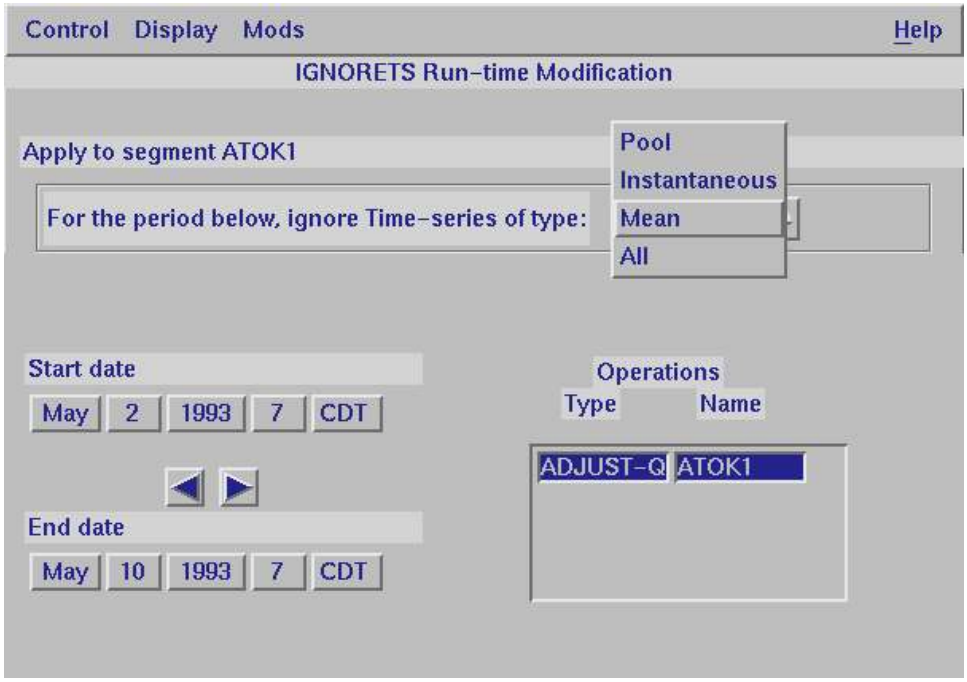

Figure 52

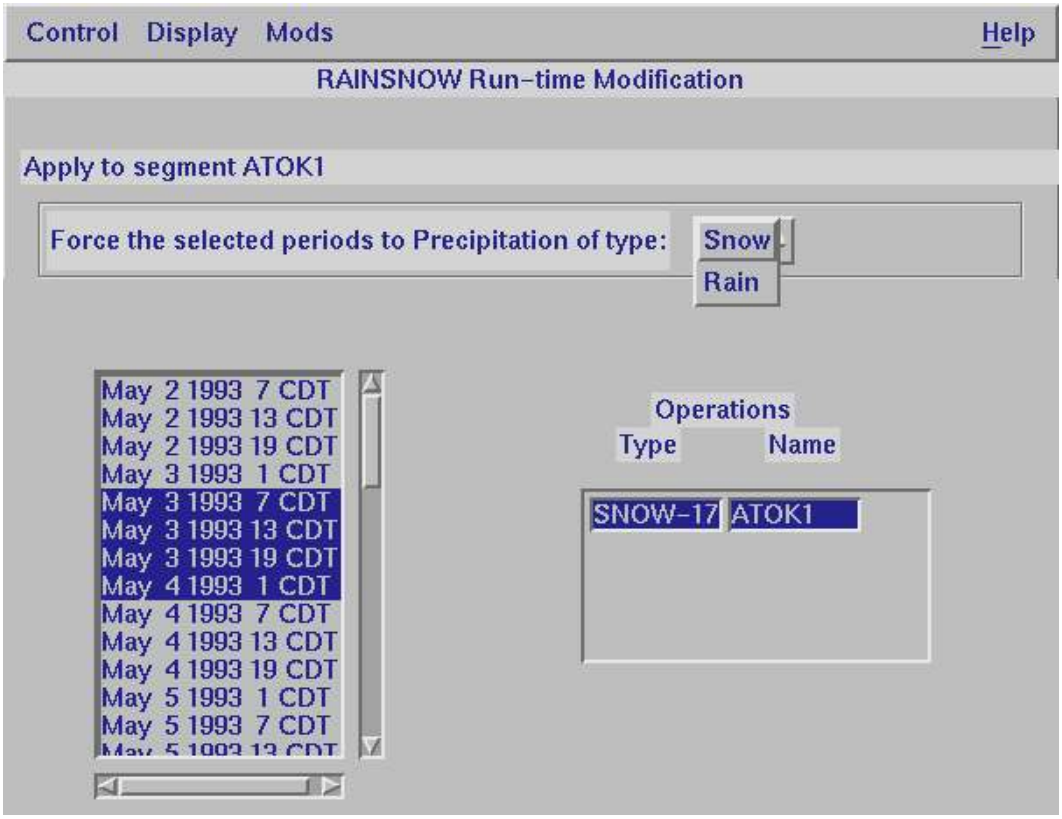

Figure 53

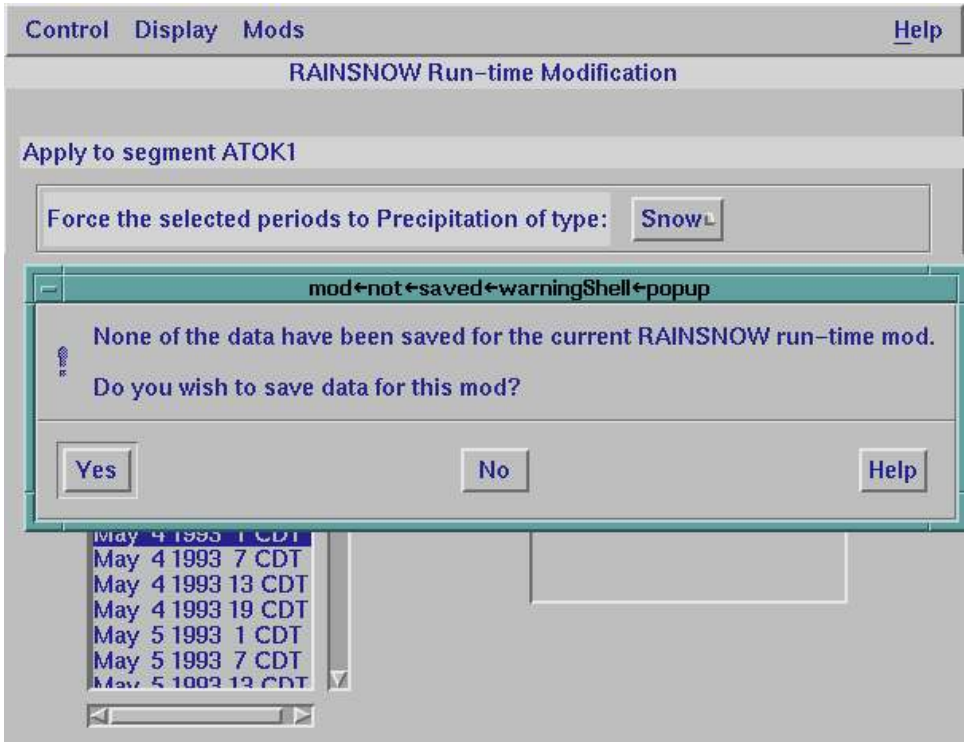
Control Display Mods Help
RAINSNOW Run-time Modification
Apply to segment ATOK1
Force the selected periods to Precipitation of type: Snow
mod←not←saved←warningShell←popup
None of the data have been saved for the current RAINSNOW run-time mod.
Do you wish to save data for this mod?
Yes
No
Help
May 4 1993 7 CDT
May 4 1993 13 CDT
May 4 1993 19 CDT
May 5 1993 1 CDT
May 5 1993 7 CDT

Figure 54

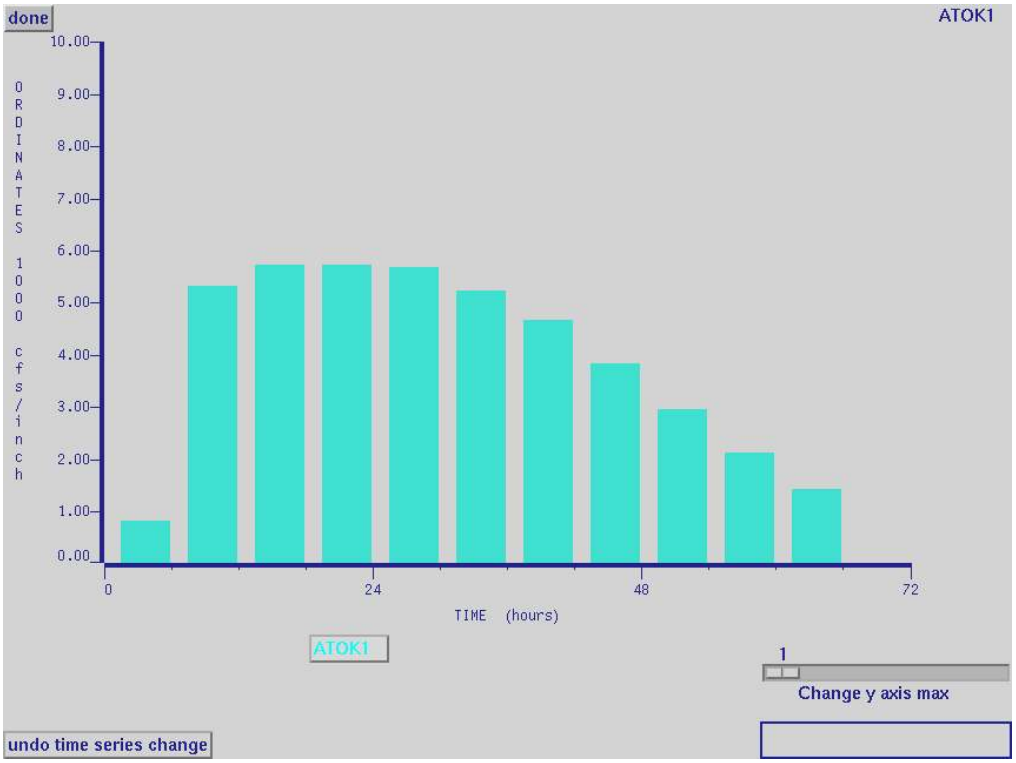

Figure 55

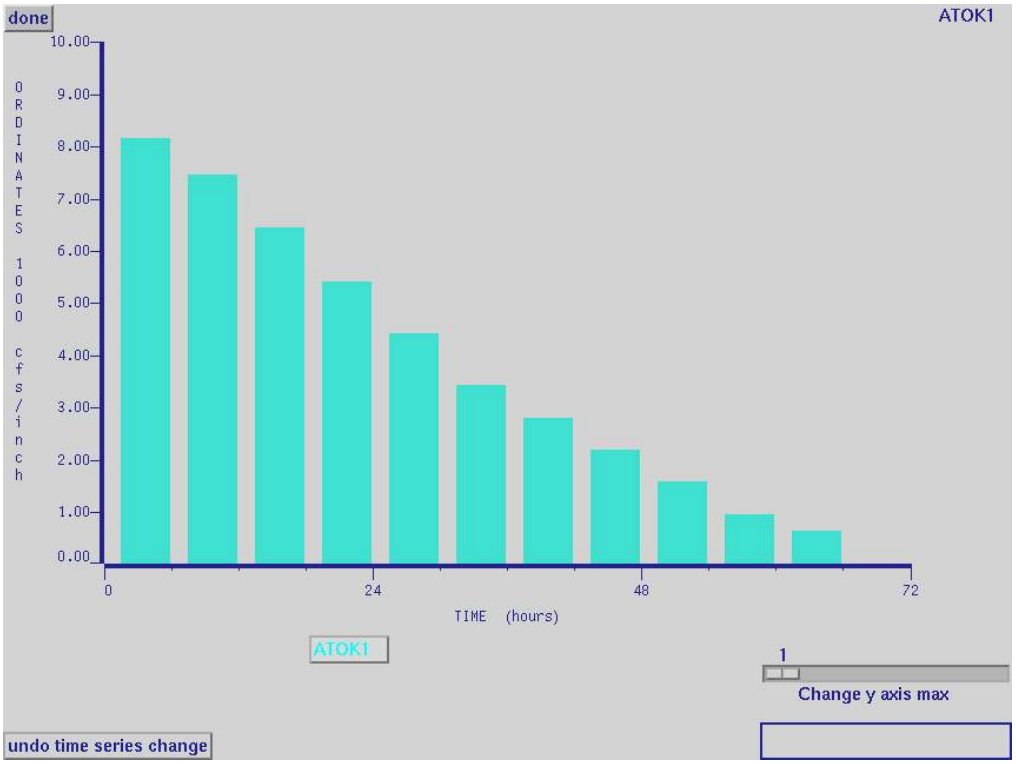

Figure 56

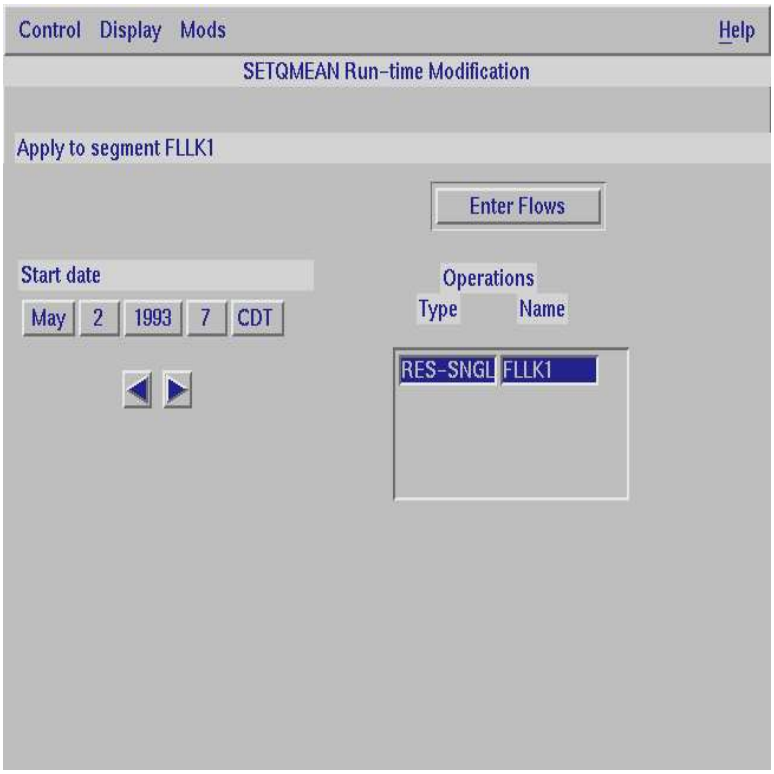

Figure 57

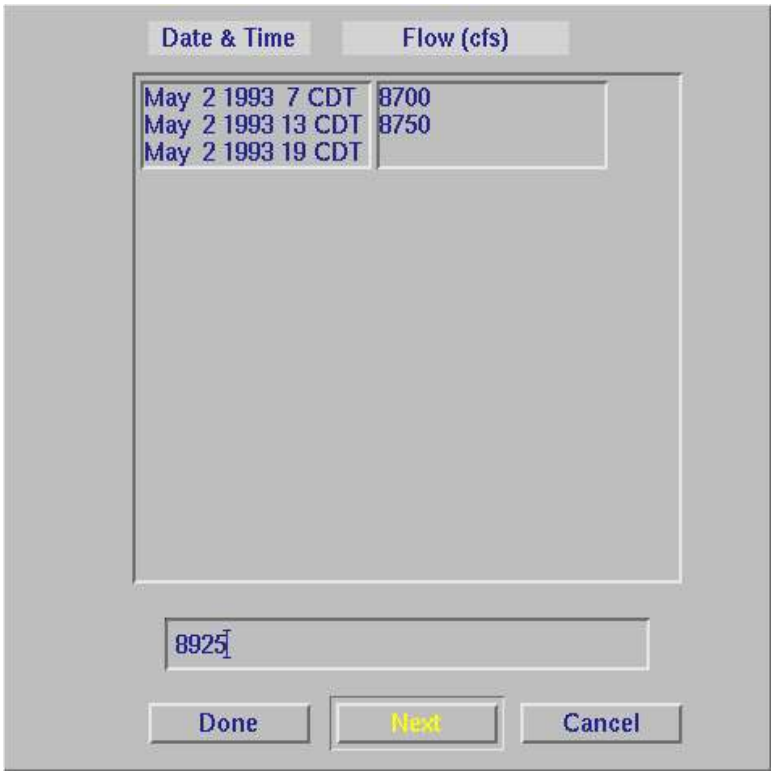

Figure 58

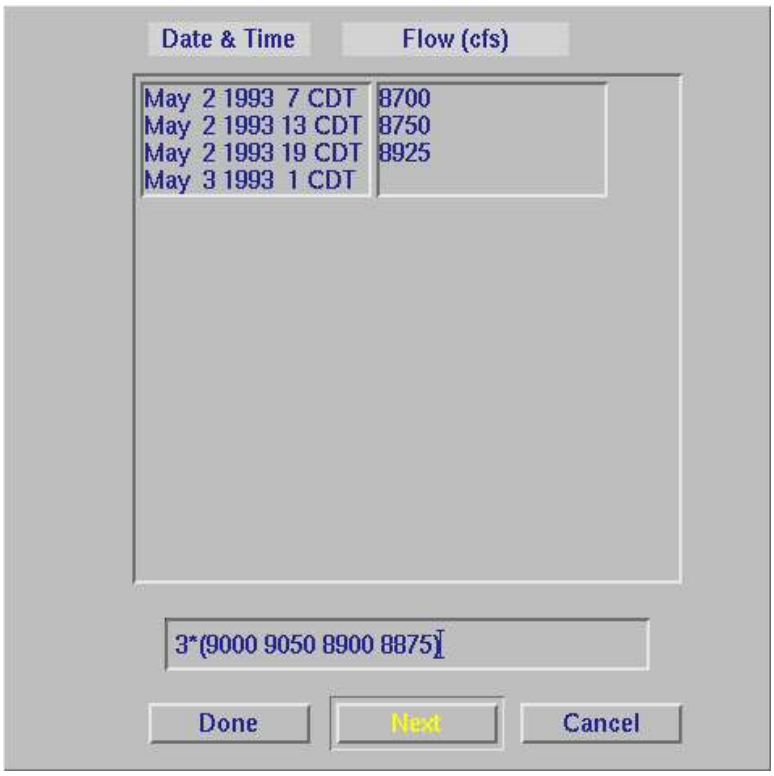

Figure 59

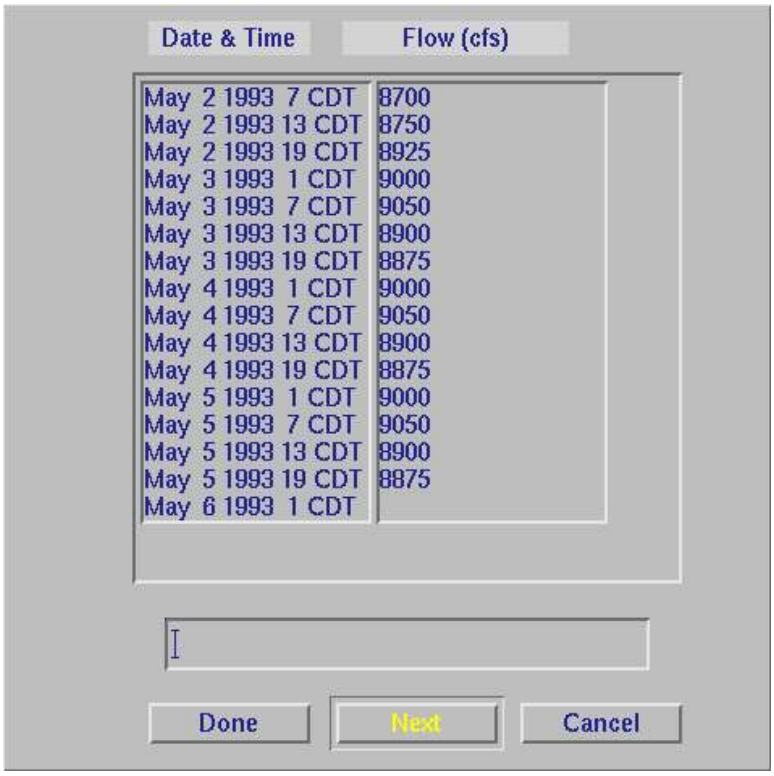

Figure 60

Figure 61